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MANAGEMENT OF CERTAIN TYPES OF FRACTURES INVOLVING THE SHAFT OF LONG BONES*

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It is with a feeling of profound pride that I have been extended the honor and privilege to address this assembly representing the medical profession of the state of Louisiana—the elite—I should say—and honored indeed to be your guest speaker on this occasion.

It will be the purpose of this presentation to bring to your attention for your consideration, our experience with the treatment of certain types of fractures of the shaft of long bones and what has been our treatment, and to offer to you the manner in which we have dealt with the different problems these types of fractures present. This presentation is based on a review of our records of some 85 cases of fractures involving the shafts of long bones of the human body.

The majority of the cases involved the middle and lower thirds of the tibia as seen in what is commonly called the "Bumper Fracture", and fractures at different levels of the shaft of the femora.

In all of the cases not one failed to unite finally. The amount of time required for union to occur varied with the different bones involved and the type of fracture being treated.

In appraising a fracture from any standpoint, one must see more than the fracture itself. Our ultimate goal must be a return of function to meet all the requirements necessary for the injured part to perform its former duties. The time element required in a certain number of weeks should and must be forgotten, for too often the surgeon as well as the patient thinks only in terms of six, eight or ten weeks.

Most surgeons have patience to wait only from one operation to the other and not for the patient to have time to get well. They lack, as the late John Ridlong once said "orthopedic instinct", for they expect all simple fractures to become united in from four to six weeks, after that it is an ununited fracture.

The sooner we learn to forget the number of weeks it may require a fracture to heal and quit thinking in terms of specified time, the sooner all of us will become better orthopedic surgeons.

Remember what Tallyrand once said "Be zealous; but don't be too damned zealous." Too, what Alonzo Clark said "Don't treat your patient too much, let them get well if they can."

A trained surgeon with the right conception and ideas of the fracture problem should be able to reduce most fractures of the long bones by proper manipulation and traction accompanied with adequate immobilization, and thus be able to direct all subsequent treatment of the patient to a complete and successful recovery.

This idea would result in the successful treatment of many fractures of the long bones that would not become necessary to

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open operations under less skillful surgeons' care.

Even under ideal conditions, however, there are many types of fractures of long bones that can and should be treated more successfully by certain internal fixations of the fragments, and the surgeon in charge should be prepared to follow that technic.

In making this statement, I am not unmindful of the recent article by Edwin W. Ryerson, of Chicago, published in Industrial Medicine on "Conservative Treatment of Fractures of the Long Bones." He said "Conditions are now different from the days of thirty odd years ago, for the types of fractures produced and often seen today. A modern surgeon on having a fracture of the humerus, or fracture of the femur to come on his services will say to himself. Had I better wire this or had I better put it up with a Lane plate, Sherman plate or vitallium plate, or had I better transfix the fracture with long screws or nails." He then continues his dissertation with a conservative plea for treatment.

All of which is definitely true. However, I am of the opinion that certain types of fractures of the long bones can be more successfully treated by methods which I hope to impress you with in this paper.

In following out the methods advocated here, one naturally must be possessed with a knowledge of bone surgery, and in a position to apply the additional equipment necessary to carry out these principles along with the proper background of good mechanical sense of the principles of proper splinting and the proper training necessary to apply them.

In bringing to your attention the use of a removable screw, or the use of a Lane or Sherman plate for the treatment of certain fractures of the long bones, it must be understood from the start that these methods are not a panacea for all fractures even of the type and types here to be shown and discussed, as there are different plans and methods used or can be used for a successful reduction of the fracture in question. There are likewise different methods of internal fixation with just as equally good results.

We all know that internal fixation is an old principle practised by Allen, Thompson, Sanderson, Sherman and others, dating back 25 years or more, with good results in selected cases. One of the purposes of this paper is to suggest and bring to your attention the present usefulness of a removable screw used and advocated by Carrell, Driver and Stuck, Carrell being the inventor of the type of screw and Stuck the type of metal used. All of us appreciate the great contribution made in bone surgery by Stuck and Venable on the use of vitallium metal; this was undoubtedly a God send to the surgical world.

In advocating the use of the removable screw in the treatment of certain types of fractures of the long bones, particularly the oblique fracture in the lower or middle third of the tibia, or the same type in the radius and ulna, and certain long or short oblique fractures in the lower one-third of the humerus as well as the femur, does not, by any means meet every demand for ideal fixation. On the other hand, neither do other fixation devices in general use meet every desired requirement. Here, as elsewhere, our own ingenuity and mechanical sense must play a part in judging if one is to use this or that method.

Fractures are too individual, and the surgeon in charge must have at his command, surgical, mechanical and other common sense ability, in order to combat the many difficult, unseen, and unexpected problems, that may arise with each case.

Our beloved Winston Churchill, in one of his many expressions, told us to expect great sacrifice of blood, sweat and tears before this present war could be won; how true is this in our everyday practice of surgery. Maybe we do not sacrifice unnecessary blood, but I am sure you will agree with me that before we accomplish the desired results in many of our fracture cases, much sweat and often tears are sacrificed. The restoration of these fractures are many times a Herculean task. If one does not have at his command all that may

be desired, obviously the next best method would naturally have to be resorted to. It is not enough to save the lives of these patients—our ultimate goal must be a return of function as near normal as humanly possible.

In our experience of some 85 cases, including several varieties of fractures, we have found that fixations of the nature herein to be described have proved to be adequate, provided the screw or pin is properly inserted and in most cases held with external fixation of plaster.

External fixation of plaster and the screw properly inserted, adequately controls completely the tendency for angulation, in the great majority of cases, until complete or satisfactory union has occurred. The method and procedure are relatively simple and easily carried out, so that a rather major operation under skilled hands can be within the sphere of a greater number of surgeons, provided he has mechanical knowledge enough to warrant his attempting such a procedure.

With the background of good mechanical sense, a familiarity of the proper principles of splinting and good surgical training in bone surgery, one may and should consider open operation with more or less impunity.

This is further evidenced by our present day knowledge of asepsis, surgical technic and operative preparations, and with the type of the metal now inserted and applied to bones in general, has reduced the former hazards in bone surgery to a minimum. However, I am not unmindful of the fact that the general surgeon, not accustomed to doing bone surgery, should be warned of attempting in general the assuring principles that it is always a safe and sane procedure to operate upon fractures without a thorough knowledge of the procedure to be undertaken. However, I am sure that a skillful technic will permit a trained operator to apply the methods herein described, being always mindful of the fact that each and every case is a law unto itself.

The principles of sound fixation in fracture treatment are obtained in most cases by suitable traction and fixation. Not infrequently, however, some types of internal fixation may be required, though the application of it should not be classified or recommended as a panacea for fracture treatment, but merely as a mechanical procedure in carrying out a principle of good fixation.

Fractures not properly reduced and certain types of comminuted and oblique fractures of the long bones can be treated far better and the fragments held in a secured and fixed position by the use of certain internal fixation, combined with adequate external fixation of plaster. It is unnecessary to discard other accepted methods of internal fixation, but rather we should choose a method to be used that suits the type of fracture with which we are dealing. There are no definite rules. In other words, one should use the method with which he is familiar, and the technic which produces the best results in his hands.

Never treat an open reduction of any kind as simple operation. There is none in my experience which requires better judgment and more perfect technic. Do not be too prone to criticize unless you have tested the method in question. Mature judgment and the results of long experience are necessary to determine without trial which fracture will have to be opened for proper fixation and which may or can be reduced and maintained without open operation.

Non-union occurs in some cases regardless of what is done, yet in the majority of cases it is due to improper fixation. Fixation is paramount, and must be absolute and maintained over a sufficient period of time for union to occur. Herein, does the internal fixation play its most needed role, for it helps to maintain the parts in a fixed position long enough for healing to complete itself.

A discourse on the treatment of fractures of the long bones would be incomplete, in my opinion, if I did not call to your attention, even though this principle has been repeated again and again, namely "the basis upon which all successful treatment of fractures has been founded is traction, applied in some manner." If one chooses the closed

method for treating a fracture of the shaft of the femora in a child, Russel's traction method by all means should, in my opinion, be the treatment of election, except in those cases involving the extreme upper third of the femoral shaft, then of course the so-called overhead traction, in which the limb is attached by Buck's extension to the overhead bar with sufficient weight to overcome shortening and angulation, is used. The Russell extension was devised and published first in 1923 by R. Hamilton Russell of Melbourne, Australia, however, it did not attract much real attention in this country before 1927, and even today does not, in my humble opinion, receive the general use it should. Every general practitioner or surgeon treating fractures should have among his armamentarium, a Russell traction outfit and should be well acquainted with its method of application. It is very simple and yet so effective; especially is it worth its weight in gold, when one is called upon to treat a fracture of the mid-shaft of the femora and he cannot have at his command any more worth-while appliance than his own ability to properly apply Russell's traction. In children its usefulness is unparalleled and can be used in the adult case as well.

The Thomas splint—the Boheler Braunts splint, also is a worthwhile method, especially the later in the treatment of adult fractures of the shaft of the femora. The principle reason I dislike either of the two later methods, it requires constant and prolonged hospitalization and meticulous care and daily supervision, while on the other hand after proper internal fixation the patient can at least, in the majority of cases, spend a greater part of his convalescence at home. Fractures of the shaft of the humerus, not including fractures of the surgical neck, or supracondylar have been shown, in a large per cent of cases, can be treated very satisfactorily by closed reduction using the hanging cast method, advocated by Caldwell of Cincinnati. It goes without saying that in certain complicated and unusual cases this will not apply.

For the introduction and fixation of the removable screw, an open exposure is made of the fracture site of sufficient length to give adequate exposure to the fracture, the fragments are approximated, the bones are held with a bone clamp after which the removable screw, or if a plate is your choice, is applied. Be sure that the screw used, whether of the removable type, or the Lane plate type, is of sufficient length to pass through the cortex from side to side, in other words, so that the end of the screw can be seen protruding through the cortex on the opposite side. This is very important for secured fixation.

Where the removable screw is inserted in certain selected cases, a separate puncture wound is made at a selected site for the screw to be passed through the fracture site obliquely. This is also important, because we do not want the extended portion of the screw which remains outside to come through the original exposure wound.

It may, of course, be necessary to insert two screws, depending on the fracture, but in the mapority of cases one is sufficient. In cases of comminuted fractures the main fragments are drilled and the smaller pieces are then placed in as near anatomic reposition as possible. A snugly fitted circular cast is then applied to include the movable joints above and below the fracture.

No set time for the removal of the screw has been followed. Frequent roentgenograms are made to determine progress of the callus formation and when in our judgment, sufficient amount has occurred, the cast and screw are removed, followed with another cast, which is to remain until healing is complete. (Editorial note: Dr. Carruthers then showed a large number of slides illustrating from the onset of the fracture to its perfect reduction. Space does not permit the publication of these roentgenograms.)

These and many others too numerous to illustrate show the wide usefulness with which this type of fixation may be employed. This plan of fixation as stated in the beginning is not a proposal to meet all requirements, but certainly does meet a

need in certain selected cases which we have found very adequate and more or less easily applied and worthy of recommendation.

It is my further opinion that the suggestions here made will be found to be sound, logical and meet all the basic mechanical requirements needed to restore fractures of this nature anatomically. If we remember further that fractures of the long bones must be treated by those same principles which govern the treatment of fractures elsewhere; and too, if we remember that these injuries, serious as they sometimes are, may and can be greatly relieved or even completely restored by the application of sound mechanical reasoning well applied, a great deal, if not all of the apprehension felt by the surgeon, as well as the patient, can be entirely relieved.

Let me conclude this dissertation by thanking you for your kind attention and with the hope that we have at least given you something to think about.

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DISCUSSION

Dr. H. Theodore Simon: (New Orleans): I can always recall Dr. Carruthers holding for us a most excellent four-ring circus in Little Rock, Arkansas, when he entertained the Clinical Orthopedic Society of America. I was impressed with his volume of cases and his excellent presentation and the fact that he, alone, entertained us for one whole day and we were thoroughly entertained and given much excellent information. I am sorry that we did not have a larger crowd to hear Dr. Carruthers.

As those of you who have seen my moving pictures over a period of years know, I have preached conservation where it can be done, especially by men not trained so thoroughly in surgery of bone and joint structures. Unfortunately the general surgeon does not realize that the same technics used at other operations do not suffice for bone surgery. We can not breathe in the joint, bone or wound, while the gynecologist can expectorate in an abdomen and get away with it. Unfortunately there has been a wave of operative surgery in fractures in the war and I am sure the men coming back will feel that that is the correct thing, especially near the front lines and in front hospitals. They have not followed final results in these cases. We are too prone to call a success where it is not a success in patients who require months and years of treatment.

I heartily agree with Dr. Carruthers in common sense application in the treatment of fractures. I believe those of us who handle these can treat conservatively and are better off than when using gadgets.

Dr. Carruthers spoke of long enough fixation and proper fixation. If improper and too short there will be bad union.

As a specialist in this section I am frequently confronted with problem cases where the doctor has been over-anxious to do some operative procedure. I believe we fail to realize, even though x-ray shows evidence of union, a splint is desirable; splinting by some type of capable, efficient splint which will take away and prevent the bone from bending. This has been shown by Dr. Carruthers. These cases frequently bend and although we get excellent position the angulation shown is a common occurrence. I do not believe we realize that the six or eight week period is for primary healing of callus and actual process of healing requires one year or more. The first callus we see is not the final and result of healing. It is the initial healing. At a later date nature takes this away and reforms callus in a line comparable with normal callus. This takes about one year.

CHEMOTHERAPY, LOCAL AND SYSTEMIC, AND ITS RELATIONSHIP TO THE FUNDAMENTAL REQUIREMENTS OF COMPOUND FRACTURES*

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Any discussion of fundamental requirements in the treatment of infected wounds and compound fractures should begin with a clear statement as to the work of Joseph Lister. Prior to the time of Lister, certain fundamentals of surgical practice in this field had become very well established. The arrest of hemorrhage, drainage of infected wounds, and even immobilization and rest

in correct position, were employed regularly by many good surgeons. It was Lister, however, who recognized the significance of the work of Pasteur, and who understood for the first time the relationship of germs to wound infection and the surgical treatment of wounds and compound fractures. Some others had indeed attempted to treat infections by other chemicals and even carbolic acid, but it was Lister who had the conception of protecting the patient and his wound against the invasion of micro-organisms by the use of carbolic acid as a chemical barrier against the organic cause of putrefaction.

This original Lister idea called, of course, at once for the employment of certain technics for surgical operations and surgical dressings. It is in this field of technic, that we have become confused and that so often Lister's original idea of excluding infection has been lost sight of in the search for a cure for wound infection.

I could quote thousands of instances of this disregard of Lister's fundamental teachings. The following is from a paper in 1920, by Edward Adams: He says, "In large infected wounds at the end of the third day the Carrel tubes were inserted, and the wound kept wet every two hours with the instillation of Dakin's solution.

"Usually beginning at the end of a week, bacteriological counts were made in order to determine progress and when the count reached one microbe to a field or less and remained this way for three successive days, the wounds were ready for a secondary suture. In most of these cases we got primary union, but we found after some experience that if any secondary operations were attempted before six months after the original injury had elapsed nearly all of these cases became secondarily infected with the *Streptococcus hemolyticus*."

Here, Lister's instructions regarding exposure of the wound, the application of chemicals to the wound surface and the enclosure of septic organisms in the wound, have all been disregarded. Actually, Lister's original teachings were sounder as to the prevention of wound infection, than many like the above that have been practiced since his time. Lister's original "antiseptic system" involved fairly simple, not very frequent dressings designed primarily to keep germs away from wound surfaces, and to protect the patient against irritation by chemicals, instruments, foreign materials, and even the surgeon's fingers. Lister was very emphatic in saying that carbolic acid should never be applied directly to the wound surfaces. While Lister knew nothing of sterile gloves, gowns, masks, or even changes of street clothing, for the operating theatre, he became more meticulous as he approached the patient and the wound surface. Chemicals were kept out, dressings were simplified, the wound surface was covered by a mackintosh, and even the surrounding skin was prepared to avoid the access of infectious organisms to the wound itself. Lister was very careful as to his own hands, and because air always had access to the wound, he adopted the carbolic acid spray, thinking to sterilize the atmosphere in the wound vicinity. Lister later confessed his mistake as to the use of the spray. Unfortunately, he abandoned also some of his other teachings and began to use chemical gauze in the wound and even rubber tubes and horse hair wicks for drainage purposes. These were allowed to lie in the wound and to be withdrawn and re-inserted carrying in then, as they have ever since, new infection. Tubes have often been shown to encourage germ growth in wounds just as they do in the laboratory.

In a recent article, David J. Lewis, (Illinois M. J., 78:530, 1940) arrives at a set of conclusions upon which I shall comment in some detail. Lewis says, "An infected wound should never be closed." I entirely agree. To cover over or sew up pockets of infection in a wound, regardless of the application of chemical antidotes, is never sound surgery. Lewis says further: "1. Debridement—In any contaminated or infected area this is essential." As I have pointed out on many occasions, debridement and drainage should really mean the same

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thing. Debridements have often been carried much further then necessary. It is undesirable to carry wound excision to the point of removing quantities of healthy tissue, or even damaged tissue that may be useful in wound repair.

Philip Wilson has called our attention to the point, that in French, debridement means "to unbridle," as one might do with a horse; taking off the accoutrements, but no part of the horse himself. This is so obviously a fundamental surgical requirement for every infected wound and compound fracture, that it should be accepted universally. Lewis says further: "2. The wound should be left open and Dakin's dressing, or some modification of Orr's technic should be employed." This is a contradiction. Lewis undertakes to combine or distinguish between a single item of wound dressing technic like the Dakin method, and my program in which all technics are relegated to second place. I have always demanded conditions with which actually the Carrel-Dakin treatment would interfere. Statements like this lead me to think that details of technic are often misunderstood as to their relationship to my program. I should always forbid Dakin dressings, or any other form of frequent wound exposure or irritation. Such technical methods cannot possibly be reconciled with the immobilization and infrequent dressing *Orr* method.

Lewis calls: "3. For immobilization and elevation of the limb;" here again we are dealing with a fundamental requirement for every injured and inflamed extremity. But varying degrees of splinting, traction, and elevation are commonly misunderstood to be true immobilization. Immobilization should always mean that kind of fixation in correct length and position, which protects the patient against muscle spasm, improper motion, and irritation or exposure of the inflamed parts. A swinging limb in a Balkan frame with weight and pulley or elastic traction does not provide this kind of protection.

Lewis calls next for—"4. "Cultures from the wound." This is a technical detail of no real importance whatever. A well drained, aseptically dressed, immobilized wound or fracture will not require culturing except under the most unusual circumstances. There is little to be gained by it, and there is the risk of wound exposure, mixed infection and disturbance of the patient. In the next paragraph Lewis says: "5. There is no need for routine antiseptic treatment." I believe we have arrived at this point already, although in No. 2 you will recall that he indicated his willingness to accept Dakin dressings, which is of course, a contradiction and wrong in my opinion.

Lewis requests that the "patient's general condition be kept up." As to this it has been my experience that no patient whose wound is well dressed, who is protected against secondary infection, and who is immobilized properly in correct position needs very much in the way of medication or a special diet. If his physiology in the damaged extremity has been restored he will be found to respond to all his normal impulses in the matter of food, drink, elimination, blood and lymph circulation, nerve supply, and that sort of thing. With satisfactory restoration of the local physiology in the injured or inflamed part the patient's general physiologic processes have a very satisfactory way of taking care of themselves.

If we choose to think, however, that some chemical is going to act as a germicide or as a bacteriostatic (whatever this is!), we should at least endeavor to provide those conditions as to asepsis, drainage, and immobilization, in correct position, under which the "magic cure" may operate with the greatest assistance from the patient himself.

As I have suggested, there was a confusion in technics, arising during Lister's own lifetime that led us into many indiscretions in surgical practice. The outgrowth of the aseptic method from what Lister called the "antiseptic system," was of course a natural development. Unfortunately, between Lister's confusion in regard to the spray, and certain other technics, German surgeons almost "stole the show," as the saying is, because the aseptic method

was more rapidly and more perfectly developed in Germany than it was in Lister's own work. It can never be doubted that the original Lister idea gave us the basis not only for all the clean surgery we are doing now, but for much more perfect control of infection both at operation and in dealing with open wounds, than has ever yet been successfully attained. Any frequent dressing method is a violation of the Lister "exclusion of infection" idea. If we once understand that, it is not difficult to decide at once whether or not a proposed technic is good or not. For example: in a recent article it is proposed to treat compound fractures and osteomyelitis by prolonged dependent drainage with lucite tubes. Dennis presents some interesting photographs of extremities being treated by dependent drainage through transparent tubes. He concludes with a report of eleven cases, under treatment for an average of fourteen months and with less than good results. Even these eleven cases need not have been attempted to demonstrate that prolonged wound drainage through any kind of tube is poor technic. One can decide without trial that such a technical method is no good, because several fundamentals of surgical care are being violated. Mechanical irritation of the wound, growth of organisms in the tubes, the insertion and removal of tubes, and the changes of dressings are all violations of Lister's original teachings with regard to the protection of the wound and the patient against mechanical and chemical damage and the introduction of germs. Although at times Lister did contradict himself in these matters, an indication of his real appreciation of the principle involved is shown by the fact that in the care of Queen Victoria, upon one occasion, he went back from the railway station and required the Queen to undress in order that he might change the adjustment of a pin in the dressing of an axillary abscess, so that there would be no danger of puncturing the mackintosh beneath his outer dressing. Lister taught that even a single puncture of the mackintosh covering the wound surface might permit invasion of the wound by new organisms, and lead to new wound infection and other septic complications.

One of the most discriminating teachers for many years on this point was William H. Welch, of Johns Hopkins University. Welch has called attention on many occasions to the danger of mixed infection and to the measures by which those infections can be avoided. No other pathologist or bacteriologist has indicated so clearly or so plainly the dangers of soiled dressings, drainage tubes, foreign bodies, and errors in technic. It was Welch also who forecast to some extent the role of bacteriophage and other natural efforts on the part of the patient to defend himself against infection. Next to Lister himself, I should say that a careful reading of Welch's writings does more to indicate the relative importance and unimportance of certain surgical technics than the writings of any other surgeon.

Let me close with a reference to another recent paper. This indicates the danger of confusion as between fundamentals and technics, in dealing with this question of infected wounds and fractures. In the Military Manual of the Surgeon's General's Office for 1943, "The Treatment of Shock, Burns, Wound Healing," Whipple submits what he calls, "our present improved program, for dealing with gunshot wounds and fractures." The five principal items he submits are (1) meticulous debridement; (2) irrigation; (3) application of sulpha drugs; (4) reduction of the fractured bones under x-ray, and (5) immobilization by plaster-of-paris. These are submitted in that order and it may be presumed that he considers them of importance in that order.

I should say that the three important items in his program, (not part of "an improved program"), but of one which I have been advocating for many years, are (1) reduction of the fracture, including the soft parts; (2) debirdement, or a drainage operation, and (3) immobilization by plaster, (including pins) or skeletal fixation devices, if necessary. We should, of course, add to this the subsequent and postoperative protection of the patient against infection. Irrigation and the application of

sulpha drugs we should omit entirely as being of secondary importance, if of any importance whatever.

Whipple goes on to provide an elaborate program of eleven items to cover the after care of these patients in the ward. This includes the changes of dressings and bedding, apparatus, surgical dressers, and many other items of technic, practically all of which may be disregarded if the other program to which I have referred is instituted at the beginning. Whipple does not mention at all the importance of infrequent dressings or no dressings at all. In many hospitals now, the program is the same as it has been at the Nebraska Orthopedic Hospital in Lincoln. The rule is that no dressings are to be done in wards. The occasional dressings required by our program are done in the operating room under conditions exactly the same as, or resembling, those under which the original operation has been performed. This has the effect of protecting the patient against secondary infection, of greatly reducing the amount of labor and surgical material involved, of reducing the total number of dressings from thousands or hundreds down to a few, and of securing for the patients a diminution in suffering and anxiety. There are fewer complications, earlier healing and a minimum of deformity and disability. The contributions to the savings in labor and anxiety to the members of the nursing and surgical staff are too obvious to require comment.

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STATUS ENDOCRINOLOGICUS

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The combined achievement by clinicians and laboratory workers in relating certain disease entities to glands of internal secretion has established endocrinology as one of the basic sciences in medicine. Its fundamental precepts, developed almost entirely by scientific experimentation, have opened new vistas in the development of our ideas concerning etiology, methods of diagnosis, and treatment of many disease entities.

Attempts to interpret endocrinologic problems have so increased the numbers of contributions to its literature and have so extended the discipline that it is no longer possible for an individual to encompass its entire knowledge; nor is it easy at present, in view of the kaleidoscopic changes, to obtain a balanced perspective in any one of its limited fields. In seeking for authentic information it therefore is necessary to suspend one's judgment when an effort is made to evaluate justly the mass of seemingly contradictory data. To many, the technical nature of the subject and the seemingly disconnected facts and theories have only served to confuse; as an unfortunate result, they have become averse to the utilization and application of endocrinological principles for the solution of their problems.

It is feasible at this time to dispose of the oft heard controversy as to whether the contributions originating from the laboratory, or those of clinicians, have been in the main responsible for the evolution of endocrinology from a branch of physiology to a mature status of its own. Seemingly, in the light of historical evidence, it is illogical to assign precedence or even to adjudicate the relative importance of the laboratory over that of clinical investigation as being the prime factor for the progress of endocrinology; for both the laboratory and the clinic, each with its own sphere of activity, are yet so mutually interrelated and interdependent on one another that such controversial discussions are both futile and sterile. To vindicate further this statement it is only necessary to consult the views of one to whom we owe the beginning of our knowledge of ductless glands, Claude Bernard. In his philosophic treatise on "Experimental Medicine" he deals at some length with the limitation of inquiry both from the experimental and clinical point of view, and the advantages of putting medical problems to the proof of comparative study; only through the establishment of a common bond and unity of purpose can a solution be efficiently arrived at. Suffice to say, that since scientific medicine has

elected to follow the permanent paths of research for the expansion of its knowledge, the intimate affiliation with the laboratory has put it in a better position to cope with its problems. Laboratory research, then, is elevated to a prominent and indispensible position; not, however, as an independent unit as many critics point out, but rather as a trail blazing pioneer. By the concentration of its efforts within well-defined limits and the utilization of the latest methods and equipment, it furnishes a means of projecting inquiry into avenues ordinarily inaccessible to clinicians. This enables comparative research to fit the otherwise intangibles into the picture of disease etiology, diagnosis, and treatment. Endocrinology has every right to be proud of its progress. In the few decades of its existence, the considerable impetus given to the study of glands of intestinal secretion, stands as a monument to our era, emphasizing as never before what coordination and cooperation of the various sciences can really achieve in accelerating medical progress.

It is admittedly difficult to maintain a neutral objective attitude under the continual pressure of conflicting reports without giving prejudicial consideration to the literature which tends to support our views. This biased state can only lead to the growth of dogma, which in turn will impede progress. Under the circumstances, criticism of the present status of endocrinology is warranted, if only it accomplishes the purpose of making us realize the limitations of our inquiry, eliminate dogma, and consolidate our knowledge so as to put it at the effective disposal of those who wish to acquire it, perhaps thereby furnishing additional incentive for more fruitful and original investigation. It is hoped that this objective will be attained by reviewing the scientific substratum upon which present day endocrinology rests, analyzing and appraising the strength and weaknesses of the methods used in the divergent approach by research worker and clinician to the related problems in the field. There is no pretense to an exhaustive survey of the problem for the magnitude of the task is beyond the scope of this limited paper. However, if by laying open to inspection a panorama of endocrinology, some of the more obvious discrepancies will be reduced or entirely eradicated, my efforts would have indeed been well rewarded.

In general it may be said that when a laboratory worker is seeking the solution of a problem he attempts first, by a process of deduction, to reduce it into simple components. The artificial exclusion of what he considers to be irrelevant factors, enables him through experimental differentiation to keep his inquiry more circumscribed.

In the gradual evolution of endocrine methodology, the fertile imagination and zeal of the laboratory workers have devised and applied many ingenious analytic methods for the solution of these problems. The following enumeration of methods represents an arbitrary division and not of precedence, for the majority of instances it is necessary to merge them in order to get a more effective answer to a given problem. Briefly then, the methods may be divided into: (1) anatomic, observation of structure; gross and microscopic studies of normal gland tissue to determine its secretory character; (2) biologic, reactivity of the animal to introduced substances; (3) physiologic, evidences of functional changes. These may be subdivided into (a) extirpation, (b) transplanting gland, (c) injection active gland principles; (d) feeding gland substance, (e) stimulation of nerves to a gland to study the possibility of secretory control, (f) pluriglandular syndromes; (4) biochemical, isolation and purification of active principles and their pharmocodynamic action; (5) pathologic, correlation of endocrine syndromes with structural abnormalities; (6) humoral control (e. g. parathyroids). In recapitulation, the guiding postulates which would unquestionably establish a given gland as one of internal secretion, but which have not been satisfactorily fulfilled in all details by the glands of internal secretion are: (a) Histologic examination shows the gland to be secre-

tory in character, and the pathologic changes in the organ are responsible for the endocrine syndrome; (b) the isolation of substances from this issue which have specific physiology and pharmocodynamic actions; (c) isolation of this product from the blood and lymph coming from a given gland.

From a laboratory point of view, the purpose of subjecting animals to experimental procedures is to obtain an uncomplicated objective symptomatology of disease phenomena. The laboratory investigator is then in the advantageous position of observing the initial dynamics of a morbid process either to a preconceived experimental objective, or to exitus of the animal. When the results of these observations are compared to those of normal animals kept under identical laboratory conditions, physio-pathologic deviations due to disease changes in the experimental animal become apparent. The advantages then of using controlled procedures is in the application of statistical analysis to the problem. The repeating of an experimental process time and again with established endocrinologic methods, subject to verification by others working under the same conditions, identifies certain glands of internal secretion with an endocrine syndrome. The statistical method is of value insofar as laboratory procedures are concerned, in that it carries a certain predictability regarding physiopathologic changes. Added pharmocodynamic interest has been created by the biochemical isolation of active gland principles, or hormones, their synthesis demonstrated by chemists, the standardization of these substances in terms of arbitrary standard animal units for uniform measurement of potency, and the therapeutic administration of these hormones to animals kept under laboratory conditions.

It must be obvious that in the gradual evolution of endocrine methodology, the investigators have not attempted to create an aura of infallibility around their discoveries, but rather to minimize the possibility of error by making painstaking observations within the narrow confines of the experiment.

However, mere observation of experimental phenomena is not enough. In the words of Abraham Flexner, "science is a matter of observation, inference, verification, and generalization." Discoveries may promise beneficent possibilities, but how can they really justify themselves, unless they are put to practical usefulness? The essential, then, of every form of experimentation is that it should analyze and collate, for it is only through analysis and collation that experimental details are brought from the realm of laboratory abstractions to clinical application and usefulness.

In the evaluation of data, that is "relevant facts and reasonable interpretations," there are sources of error to be considered which to some extent might modify the recorded observations. They are: (1) Deduction: in reducing a problem to simpler components, can it be certain that the worker has been dealing with real or supposed factors? If the preconceived premise rested on an insecure basis, then the experimental findings may be inconclusive. (2) Personal: What training, intelligence, keenness of perception, and mastery of methods in use were possessed by the investigator? These attributes, so little known about, are nevertheless important enough to merit consideration. (3) Supervision: Are the devised experimental procedures adequate to answer best the question to be tested? When in doubt, advice should be sought from others more acquainted with the methodology in the field of inquiry. (4) Induction: Is the worker warranted in drawing certain inferences from his data, and fitting them into the complete and harmonious disease entity?

Since the biologic sciences are on a lower scale of accuracy and constancy than the physical sciences, they are more apt to feel the impinging influences of modern civilization. As a result of the mechanization and speeding up processes so much in evidence around us, other factors of error have been introduced which add to the general con-

fusion. These are: (1) The postwar prosperity has led to an influx of students to the institutions of higher learning, thereby increasing the number of workers, laboratories, and periodicals. The sacrifice of quality for quantity has perhaps found many workers unqualified for the pursuit of laboratory investigation. (2) Perfections in technic: The introduction of more accurate instruments has made possible more precise determinations of physiochemico-pathologic phenomena. This may or may not modify the interpretation of earlier observations. (3) Endocrinology, no less than other sciences, has been subject to fads. The paramount enthusiasm today is in the field of pharmacodynamics, which has given rise in the literature to many facts, speculations, and predictions, all of which have borne little fruit. (4) The increase in laboratory personnel has scattered publications in journals not entirely devoted to endocrine research. Under the circumstances of doubtful supervision, the selection of articles may be of questionable merit. (5) Rapid communication contributes to the swift dissemination of discoveries. As a result, they may be applied long before the possible consequences of their deleterious effects have been properly evaluated.

It is apparent from the foregoing statements that the old criteria of respecting evidence and not authority must be somewhat amended, and adopted with certain reservations. A research worker must look beyond the conclusions of a paper, satisfying himself on the experimental procedures, observations, interpretations, and minimal error before adopting certain inferences as a part of his endocrine armamentarium. Left to himself, the mass of contradictory data are apt to cloud his judgment. To avoid this dilemma his only recourse is to turn either to journals entirely devoted to endocrine research, or for guidance to men eminent in his field of interest. It is therefore incumbent on these sources to set standards of excellence and to furnish for him an inspiring leadership.

The practice of medicine is exceedingly complex. As an art it is concerned with a number of social and extra-scientific questions which transcend its boundaries. As a science it is still concerned with observations and interpretations of disease manifestations.

While it is true as knowledge expands specialization must of necessity contract, nevertheless clinical endocrinology at present is far from a circumscribed specialty. Its wide ramifications into the domains of almost every specialty of internal medicine has made delineation of the two very difficult. It follows then that a clinical endocrinologist in order to maintain a high standard of proficiency, must not only be basically an able internist, but he must also be alert to laboratory and clinical discoveries; to know the value and limitations of scientifically proved measures, and to use them to the fullest extent in deciding diagnosis, prognosis, and treatment of endocrinopathies. This he must attempt to do to fulfill his obligations as a physician.

Not being ordinarily justified in submitting human beings to experimental conditions, he must reach his objective by resorting to the compensatory procedures of cross examination regarding history, and record symptoms to establish criteria of functional changes. Having reached the limits of detailed examination by the senses, a use is then made of a number of clinical instruments of precision. The laboratory is also sought as an adjunct to diagnosis.

As the fundamental sciences have contributed a mass of scientific determinations, with a wide field of application, it became necessary for the physician to broaden the scope of his training in order to be able to interpret, correlate, and utilize the findings of the laboratory for a given patient. The careful control of clinical studies by necropsy findings, the introduction of supplementary devices as aids to diagnosis, and the study of active patho-physiologic dynamics of morbid processes, have given renewed impetus to the progress of internal medicine. Since the physician deals primarily in human relationships, he has at

times neglected this phase of practice by laying undue stress on the question of diagnosis.

The subject of clinical endocrinology is so intricate that even the most enthusiastic exponents shrink from dogmatism. In order to clarify our ideas, let us by a process of dissociation approach this subject from the clinical standpoint of diagnosis, treatment, and prognosis, paying attention to the similarity in methodology to the laboratory, the accumulation of information not ordinarily accessible to the laboratory investigator, and the completion of the composite picture of an endocrinopathy.

DIAGNOSIS

A careful history is a means of discerning both the subjective and objective dynamics of a disease process. This is somewhat analogous to the initial laboratory procedures, in that the control period represents the stage before the onset of symptoms, and the progression of the morbid process is evidenced by present history. However, certain relevant factors make their appearance which may obscure or unduly emphasize the operating influences of the disease, namely, the patient's psychic reactions as evidenced by exaggerated mental or emotional states. Separation of the patient's reaction to his environmental influences (social, sex, economic) from that of the patho-physiologic changes may result in subsequent errors of clinical judgment. It is only through the harmonious relationship (an indefinable quantity) between endocrinologist and patient, that a proper selection of the characteristic and essential features of a disease can be made. A proper evaluation as to the relative importance of these factors would not only be instructive to the clinician, but also assure him the cooperation of his patient.

The recording and classification of symptoms not lending itself to precision represents a difficulty in itself. Different from the laboratory investigator who through controlled procedures has induced the disease and observes an uncomplicated symptomatology, the endocrinologist is faced by a multitude of physical and mental complaints, depending on age, sex and chronicity of the disease. Since the endocrine glands are in intimate relationship with the nervous system, in a manner not fully understood at present, the endocrinologist must retain the following possibilities in regard to their behavior: (a) emotional factors may either express themselves in psycologic terms giving rise to subjective experiences; (b) in patho-physiologic terms of structural changes; (c) they may be in operation long enough to cause so-called functional changes in the endocrine system. Further, chronicity of the disease is of importance in that long standing pathology, and the resultant endocrine imbalance may produce changes in several glands of internal secretion, with an ensuing pluriglandular syndrome. Even should a necropsy be obtained, he must rule out the possibility that functional anatomic changes may have resulted from the reaction of the gland to morbid processes elsewhere. At present, due to the above difficulties, only sporadic attempts have been made to accumulate endocrine anthropometric data, which are so essential to the classification of a disease. The question then arises whether there is justification for the use of statistical analysis in disease with so many variables (age, familial, e.g., Lawrence-Moon-Biedl syndrome, sex, chronicity, psychic factors) to be considered. The difficulty in applying statistical observations to clinical endocrinopathies lies in the fact that there is an indeterminate starting point, and the diagnosis of the disease state may not be uniformly established by other qualified endocrinologists. In the hands of the laboratory investigator who can regulate his variables with controlled procedures, this type of data is invaluable. However, the clinical application of statistical analysis to patients and the inferences drawn from this method should warrant the closest scrutiny.

The patient is then subjected to an examination in which clinical instruments are used to establish measurable objective details. Laboratory determinations are also made to establish the inner mechanism of disease. The accumulated data are then an-

alyzed with the view of interpreting the patho - chemico - physiologic changes in a given patient. Again, it should be emphasized that in so far as clinical endocrinology is concerned, the laboratory findings should be an adjunct to diagnosis and not supersede the clinical impressions to be obtained from the patient.

TREATMENT

Before instituting any form of therapy and accurately judging its effects on a given patient, the clinical endocrinologist must eliminate certain age-old empiricisms before drawing unbiased conclusions as to the results of his treatment. (1) In the majority of human ills there is a tendency to improve, and the administration of any medicine will thus be followed by improvement. It may be feasible to assure oneself that the specific remedial measures and not the ordinary succession of events were responsible for the improvement. (2) Suggestive therapy whether used deliberately or indirectly is an important factor in therapeutics, and in the field of endocrine therapy it is no less important.

Though the author is well aware of the beneficial medical as well as the surgical procedures in use for the amelioration of endocrine complaints, the indiscriminate use of organo-therapy as outlined by the detail man, has aroused protests and condemnation from many quarters of the profession, to the extent of overlooking its valuable assets when judiciously administered.

It is to be admitted that at present endocrinology is not a restricted field; therefore many clinicians only superficially acquainted with its basic principles feel free to treat patients with endocrine complaints. In the present enthusiasm for the administration of hormones in endocrine as well as non-endocrine diseases, the arbitrary guides to treatment, namely; (a) established diagnosis; (b) control of psychic factors; (c) indications for substitution or stimulative therapy; (d) acquaintance with the advantages and limitations of hormone therapy; (e) potency and dosage of hormones subject to individualization; (f) possibility of anti-hormone effects have not been adhered to. The resultant confusion in the field of organotherapy has made conservative clinicians skeptical as to the efficacy of hormone administration on patients. The achievements of this phase of endocrinology as judged by rigid scientific standards are few, yet the possibilities still remain limitless. In the opinion of the author the future progress in the field of organo-therapy will be dependent upon the re-evaluation of its resources, established indications for usage, and the scientific detachment in noting its effects.

PROGNOSIS

Since there are so many variables, an accurate prognosis as to the dynamics of a disease process is difficult to render. However, the following influences must again be reiterated for consideration: (1) chronicity of the disease; (2) age; (3) sex; (4) understanding of the physio-chemico-pathologic factors involved; (5) intelligent handling of a patient and the understanding of his specific problem; (6) basic knowledge regarding the therapy in question; (7) a follow-up system in order to evaluate the results of the treatment over a period of time, particularly when concomitant organic disease complicates the endocrinopathy.

The clinician no less than the laboratory worker must guard against the unequivocal acceptance of conclusions. He, too, in the pursuit of a solution of his problem is subject to the same sources of error which may cast doubt on his clinical reasoning. However, it is not possible to calculate the extent of error with any degree of mathematical certainty, since it is difficult to evaluate scientifically the uncomplicated effects of therapy.

In recapitulation, let us again note the effect of merging of the laboratory and clinic facilities for the solution of endocrine problems.

LABORATORY

(1). Start with a normal animal.

(2). Induce physio - chemico - pathologic changes with controlled procedures.

(3). The dynamics of a disease process with its uncomplicated symptomatology are closely charted.

(4). Statistically repeated. Can predict morbid changes.

(5). Biochemical methods used in the isolation and standardization of hormones.

(6). Having established dosage, pharmocodynamic changes can be approximately evaluated.

The process of analyzing and collating the above data makes possible its utilization by the clinical endocrinologist.

CLINIC

(1). Conversely tries to explain subjective and objective symptomatology on the basis of patho-physiologic function, thus furnishing scientific proof for the experimental observations noted in the laboratory.

(2). Clinical instruments and laboratory determinations are scientific aids in recording and classification of disease.

(3). Treatment with products isolated or synthesized and standardized by uniform laboratory procedures again furnishes the clinician a means of confirming the discoveries originating from the laboratory.

The inferences to be drawn from the foregoing generalizations are that clinical exploration and laboratory investigation are equally necessary in arriving at a final solution of a problem. Further, that the laboratory and clinic are only purveyors of provisional approximation to the truths, representing the best they can do with the knowledge at their disposal.

CONCLUSION

If undue attention has been drawn to discrepancies, and errors magnified, it is hoped that a healthy skepticism would be maintained regarding the acceptance of the validity of theoretical considerations. The complexities of the subject are simplified, and a balanced perspective in the field of endocrinology is maintained only through the understanding of basic physiologic principles and methods of approach to endocrine problems.

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BLOOD TRANSFUSION SUBSTITUTES: PRESENT STATUS

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INTRODUCTION

Recent years have seen the advent of considerable experimentation with blood transfusion substitutes. The word plasma has become as well known among the laity as among the medical profession. The effects of plasma are conceded to be equal, and frequently superior, to the effects of whole blood.

The subject of blood substitutes has become prominent recently because of the present world conflict. Physicians for many years, however, have recognized the value of blood transfusion, and many substitutes have been proposed and used. In 1878, for example, a Dr. Thomas enthusiastically presented a paper on "Intravenous Injection of Milk" as a substitute for blood. Thomas felt that, because of its resemblance to chyle, milk would be as efficacious as blood yet free from its many dangers in transfusion. He proposed that "the cow should be milked at the door of the patient's residence, by clean hands, into a clean pail covered with fine gauze." The effects of this procedure were "often quite unpleasant and even alarming" with a rapid pulse and "respiration of a sighing character." Thomas felt that these effects denoted a "profound impression upon the nervous system." Six patients were treated with milk infusion by Thomas and five of them lived—probably not because of the therapy but in spite of it.

Because whole blood, even when citrated, deteriorates rapidly and must be matched before it can be used, there has been a persistent search for a practical substitute.

Taylor and Waters have suggested that a fluid, to be adequate as a blood substitute, should meet the following requirements: It should be non-antigenic, non-toxic, cheap, easily prepared and available; it should be near the viscosity of whole blood, not leave the blood vessels too rapidly, and be nearly isotonic with the red blood cells.

It is the aim of this paper to present a review of blood substitutes up to their present

status. It is well to note that some of these are not mere substitutes but are well recognized as having great therapeutic value in themselves.

GUM ACACIA

Gum acacia was one of the earliest widely-used blood substitutes. From 1916 until the present time it has been a method of combating shock. Morowitz, in 1906, demonstrated its effectiveness in the restoration and maintenance of circulating blood volume. Baylis restored its waning popularity during World War I, where it was used extensively. The consensus today is that gum acacia has an antigenic action, causes liver damage, and does not supply the body with the protein it needs; thus it has fallen into disrepute.

CRYSTALLOIDS

Though long used as blood substitutes these substances do not adequately meet the desired requirements. Saline and glucose solutions are efficacious when salt and water are needed by the body but are of little value in shock or hemorrhage, the conditions from which the main need for blood arises.

GELATIN

Gelatin-saline solutions were also used during World War I but were discarded when found to produce intravascular clotting and to have an antigenic factor.

Within the last year, however, Parkins, and others, have produced experimental data which may renew the interest in this blood substitute.

These workers used calcium gelatinate made from collagen of bovine long-bones in a 6 per cent concentration in 0.85 per cent saline solution. They used dogs as subjects and found no serious toxic effects after repeated infusions of gelatin-saline in normal animals. Liver and kidney function remained unimpaired. However, a pseudo-agglutination of red blood cells and an increased sedimentation rate occurred. Tissue changes were more pronounced than with plasma but were reversable.

Following controlled hemorrhage and standardized burns, three groups of dogs were treated with plasma, saline, and gelatin-saline respectively. The plasma treated animals showed the best recovery rate, and the gelatin-saline group was next.

Parkins and his co-workers believe that a certain factor in plasma which accounts for its ability to maintain blood pressure during the secondary or toxemia stage of shock is lacking in gelatin-saline preparations. If this unknown factor were added, they believe, gelatin would be an adequate plasma substitute.

It is obvious that the status of gelatin as a blood substitute is undecided. The material is of apparent value in the early stages of hemorrhagic shock and probably as a post-operative prophylactic. Nevertheless, further clinical investigation is necessary before its use in this field can be established.

ISINGLASS

This substance, also a gelatin, is prepared from the swim bladders of certain fish. Several Canadian groups have initiated the investigation to determine its value as a substitute for blood.

Taylor and his group found that isinglass was valuable in the treatment of patients who have had an acute hemorrhage.

They noted no antigenic action of the substance. No kidney or liver abnormalities were caused by repeated injections of isinglass into experimental animals. This collagen has a pyrogenic action, however.

The pyrogenic action was also noted by Pugsley and his co-workers. They found a moderately severe febrile reaction occurring in a small percentage of patients given isinglass.

Pugsley's group used a 4 to 7 per cent concentration of purified, powdered isinglass in saline. They found isinglass of value in shock therapy and feel that it is a safe blood substitute.

Though further clinical studies must be made before its use can be accepted, the potentialities of isinglass-saline as a blood substitute are great.

ALBUMIN

Human albumin has recently found a place in Military Medicine. Because ad-

bumin is 62 per cent of the total protein of plasma and has other desirable features of plasma, namely solubility and stability, it is being used in a concentrated form to combat shock. It maintains osmotic pressure very effectively and draws fluid into the circulation causing the hemodilution desirable to offset shock.

However, to administer this substance without supplementing fluid is thought by some to be dangerous. Necheles warns against any concentrated solution (whether it be serum, plasma, or albumin) in severe shock or hemorrhage, because it draws fluid from already dehydrated vital areas.

Plasma or some other fluid should follow the injection of albumin. The latter must be considered as purely a first-aid treatment.

Newhouser and Lozner rightly believe that serum albumin should not be considered a substitute for plasma or whole blood. As Henderson has pointed out, there is a potential military use for albumin because its compactness facilities transportation. However the difficulty in preparing it plus the facts that it is inferior to plasma and is more dangerous in its action prohibits its widespread use in civilian life.

PECTIN

Much interest has been aroused recently by the use of pectin as a blood substitute. Strictly speaking though, pectin is of little value as a substitute for whole blood, but is valuable as a substitute for plasma.

Meyer and his group in Chicago have been the latest observers of pectin solutions. This substance is an acid derivative of citrus fruits. In Ringer's or sodium chloride solutions 1.5 per cent of pectin has a viscosity slightly less than that of whole blood and exerts slightly greater osmotic pressure than plasma. The acid solution must be buffered with sodium phosphate or lactate to a pH of 7.2 before administration.

Clinically, it has been found to relieve permanently the majority of patients to whom it has been given as a means of combating not too severe cases of shock. Blood pressure has been significantly raised and sustained for twenty-four hours in the average clinical case of shock. In treating shock the desirable effect of hemodilution was obtained by pectin infusions and was maintained at least twenty-four hours. Repeated administration of pectin brings on no untoward reactions; yet no additional improvement results in the patient who has not sufficiently improved initially.

Aside from a possible pyrogenic action, no systemic or local toxic manifestations have resulted from intravenous administration of pectin. It is eliminated by the kidneys within five days of administration, and apparently has no antigenic effect.

The increased sedimentation rate produced by the hemodilution resulting from pectin administration does not contraindicate its use. The beneficial results of the substance in the treatment of shock are due to an increase in plasma volume and to the maintenance of osmotic pressure. Plasma itself produces the same phenomena; so the true value of pectin is in emergency conditions as a substitute for unavailable plasma.

As a plasma substitute pectin has probably the greatest potentialities of any substance excluding the blood derivatives.

RED CELL SUSPENSIONS

So far I have dealt with those substances used primarily in the treatment of shock, hemorrhage, and burns. These conditions are undoubtedly the most important in which blood transfusion or plasma is needed. However, pectin, albumin, gelatin, or even plasma would be of very little value in the treatment of anemias where the main problem to be dealt with is a lack of the solid elements of the blood.

With this condition principally in mind, much investigation has been carried on in recent years concerning red blood cells in concentrated suspensions or in nonplasma solutions.

The Russians were among the first to use red cell suspensions. They, as do we, produce plasma for military use on a large scale. Red blood cells are a by-product of

plasma preparation and the USSR has made use of this by-product for some time.

Their preparation is known as "I.P.K." solution and is a suspension of discarded red cells, from plasma preparation, in a solution of magnesium sulfate, potassium chloride, and sodium chloride. Apparently they have had excellent results in the treatment of blood dyscrasias with this preparation.

Evans, Alt and his group, and Murray and his co-workers have done a great deal in investigating and popularizing the use of red cell suspensions in this country.

Red cell suspensions have been used in all types of anemias, in leukemias, in hemorrhage, in nutritional deficiencies, in nephritis, and in cirrhosis of the liver with results equalling or bettering whole blood transfusions. Unfavorable reactions occur less frequently than with whole blood transfusions.

The practicability of giving large quantities of cells rapidly; the factor of the small fluid volume, which is essential in cardiac cases; and the economy of procuring the red cells, due to the availability of plasma are the advantages of red cell suspensions over whole blood.

The inconvenience of matching the donor's cells with the recipient's serum is acceptable because there is rarely an emergency existing when this substance is needed.

It has been found that the addition of only a small amount of isotonic saline to the packed red cells is needed to facilitate their flow through the needle into the recipient's vein.

Like whole blood the red cell suspension is not stable for long. Best results are obtained if the cells are infused within three days after they have left the donor, during which time storage at 4-6° C. is desirable.

Obviously the infusion of red cell suspensions is not only a good substitute for whole blood transfusion but is a good method of treatment in its own right.

MISCELLANEOUS SUBSTITUTES

Many agents have been proposed and used as blood substitutes with more or less success. Among this group is ascitic fluid. This fluid requires typing because it has specific agglutinins, and it may cause reactions. The supply is not dependable, and it is limited. Though still in the experimental stage ascitic fluid offers no great potentialities as a practical blood substitute.

The administration of amino acids provides a direct way of correcting protein depletion and has been shown to be of value in treating experimentally induced shock in dogs.

Bovine albumin and plasma have been used with good therapeutic results. However, both cause sensitization of the patient to bovine protein. Recent investigation by Dunphy and his co-workers indicates the possible value of small amounts of concentrated, purified bovine albumin in the first-aid treatment of shock.

Hemoglobin-Ringer's solution has a potential value. An osmotic pressure higher than that of plasma can be exerted by this combination, and it also has an oxygen carrying capacity. The procurement of hemoglobin would necessitate the procurement of red blood cells and plasma, however, and both of these are superior therapeutically to hemoglobin-Ringers per se. If only hemoglobin is needed, this combination is of value.

The Swiss have experimented lately with muscle extracts, the value of which as a blood substitute is doubtful.

Recently the Germans have perfected a synthetic colloid composition called Periston. This has a high molecular weight and a strong affinity for water. It raises and maintains the blood pressure and blood volume and is apparently well tolerated intravenously. The advantages or disadvantages of this colloid as a blood substitute are familiar only to the Germans at present.

PLASMA AND SERUM

Plasma and serum differ in that plasma is the fluid portion of blood obtained after an anticoagulant has been added to whole blood, whereas serum is the fluid remaining after a clot has been formed. Serum is minus the plasma protein, fibrinogen.

For practical purposes these two substances can be considered together. Plasma is used almost to the exclusion of serum in this country, whereas serum is more popular in England. More unfavorable reactions are known to occur from serum than from plasma injection.

The widespread use and knowledge of plasma make discussion of it almost unnecessary. No salesmanship is needed to "sell" plasma to the physicians serving with our armed forces.

Plasma in the dried form is the safest transfusion medium now available on a large scale. Not a mere blood substitute, plasma is an approved therapeutic agent in itself. Plasma is more effective than whole blood in the treatment of shock, and shock constitutes the main need for intravenous fluid at the present time. Severe infections, hypoproteinemic states, some blood dyscrasias and cerebral edema are all best combatted by plasma administration.

Three forms of plasma are available today: liquid plasma, frozen plasma, and dried plasma. The liquid form is kept under refrigeration at from 5-6° C. and is the most practical form for hospital use. There is a slow loss of prothrombin and fibrin, however, making it satisfactory only over limited periods of time.

The frozen plasma must be kept at from —15 to —20° C., at which temperature it remains stable indefinitely. The constant low temperature and the cumbersome apparatus needed are the main disadvantages of frozen plasma. Its efficacy in war time is doubtful.

The dessication of plasma is today carried out by what is popularly known as the "lyophile" process. This procedure in brief consists of, first, collection of blood from healthy, adult donors: though the spirochete would die in the processing no luetic blood is used. The blood is next sent under refrigeration to processing laboratories, where centrifugation separates the plasma and formed elements.

Plasma from fifty bleedings is then pooled and a preservative added. The plasma is put into its final container and placed in a "shelling" machine, which rotates the container in a freezing bath; and the plasma is rapidly frozen to the walls. The resulting large surface area of plasma facilitates the dessication, which is carried out in a vacuum. There is less than one per cent final moisture remaining when the container is vacuum sealed. Simple addition of pyrogen-free distilled water makes the plasma immediately available for use. No typing is necessary.

This lyophile process yields dessicated plasma that is stable and retains its therapeutic value for at least five years.

Plasma has many practical advantages over other blood substitutes. It contains all the blood proteins, and exerts a high osmotic pressure. Circulating blood volume is restored and maintained; thus the hemoconcentration following shock and burns is offset.

The amount of plasma to be administered in each case is an important consideration. It is safely given in large amounts, however, 950 c c. having been administered in one dose with no ill effects.

Jenkins and Schafer have recently published a very practical guide for plasma replacement and whole blood administration. This is in the form of a chart, which is based primarily on hematocrit values and body weight, the two variables most easily determined under emergency treatment.

An equally easy guide to follow is to administer plasma enough to keep the plasma protein level at 6 grams per cent and the hematocrit between 50 and 55 per cent.

CADAVER BLOOD

Since 1927, the USSR has been interested in the use of cadaver blood for transfusion.

The primary objections of physicians when approached with this subject are that blood from dead bodies contains toxins from the autolysis of tissues and that it has an abundant bacterial population.

Russian scientists, led by Shamov, have offset these objections by showing that there is no great toxicity of cadaver blood from autolysis of tissues until thrombi begin to form in the cadaver's vessels. These

do not occur until four to six hours post mortem. True, bacterial flora, in an otherwise uncontaminated corpse, does invade the blood and other organs by passage from the gastrointestinal tract into the portal system; but, this takes place slowly, even if the cadaver is not kept at low temperature, and portal system blood is not used in transfusions. Therefore prompt removal of the blood from an uncontaminated cadaver would cancel the problems of toxins and bacterial contamination.

Red and white blood cells retain their vital capacity and the ability to carry on their physiological roles if they are removed from the cadaver within ten hours after death. Kept at freezing temperatures the blood, once removed, is usable for ten days or more.

Cadaver blood, according to Shamov, shows fewer unfavorable reactions than blood from living donors. The Russians believe cadaver blood to have immeasurably greater safety from the standpoint of disease spread than that from live donors. This belief is based on the fact that aside from serological and bacteriological examinations of the blood itself, the cadaver also receives a more thorough pathologic and anatomic investigation inside and out than could be given a live donor.

The Russian donor is usually a person who has died suddenly of heart disease or of a cerebral vascular accident. The blood is citrated as it is withdrawn from the jugular vein in a closed system using an aseptic technic. Up to 4,000 c c. of blood has been obtained from one cadaver in this manner. The blood is stored at low temperatures. Naturally it must be matched with the recipients blood before its use.

Erf, among others in this country, has advocated the use of cadaver blood as a source of plasma. He has taken such blood from an individual who died of heart disease and put it through a process of freezing and drying similar to the "lyophile" process described previously. After restoring the plasma to liquid form with distilled water and injecting it into a patient, he found that the reactions corresponded to those occurring when plasma from living donors is used. No antigenic, hemolytic, or febrile reaction was noted.

A sufficient supply of cadaver blood could be obtained in this country from morticians. It could be used for plasma or red cell suspensions, or it could be broken down to more basic elements, like albumin and globulin, and used specifically as needed. Standards should be established for the technic of blood collection and processing. Selection of cadavers as to cause and time of death should also be standardized. Above all the realization by the medical profession of the practicability and desirability of cadaver blood is necessary to further its usefulness and availability.

CONCLUSIONS

Several blood substitutes have been discussed and an evaluation of each attempted. It is very obvious that plasma is the most satisfactory all-around blood substitute for the conditions most often needing intravenous fluid.

Red cell suspensions will undoubtedly become the most prominent therapeutic agent where the solid elements of the blood, and not blood plasma, are needed.

These two substances go hand-in-hand as the principal blood substitutes. One is needed in one condition and the other in another condition. One is the by-product in the production of the other. Nothing is wasted when both are used.

Today adequate plasma is obtained for the armed forces by patriotic donors. Previous to the war plasma was obtained from professional donors and was very expensive. Unless some program of public donation is maintained, plasma will again become expensive, while the need for it will remain. Without the impetus of the war, I believe, the people will not be as generous in their blood donations.

A remedy for this constant threat of plasma scarcity would be the use of cadaver blood. It is my belief that the medical profession could, through a concerted effort, familiarize the public to the advantages, and urgent need, of using cadaver

blood. Once people are made to see how much more sensible and humane it is to take blood from the dead rather than from the living, superstition and prejudice will be overcome; and the use of cadaver blood will be an accepted and common practice. It should not be too difficult to alter the public sentiment; already people are learning of, and accepting, the transplanting of cartilage, corneae, and nerves from the dead to the living.

Plasma and red cell suspensions of cadaver blood would enable the continued use of these substances as the great therapeutic agents that they are.

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FURTHER OBSERVATIONS ON CARCINOMA OF THE STOMACH IN A LARGE GENERAL HOSPITAL*

WITH SPECIAL REFERENCE TO ONE HUNDRED THIRTY-FOUR NON-SURGICAL FATALITIES FROM CHARITY HOSPITAL OF LOUISIANA AT NEW ORLEANS

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NEW ORLEANS

I believe as strongly as any surgeon that carcinoma of the stomach is curable. I view with deference and almost with reverence the results being achieved at some institutions and by some groups in this country, from the standpoint both of resectability and of long term survival. I realize what can be accomplished by total gastrectomy. I am aware that even such formerly hopeless phases of the disease as carcinoma of the cardia are now, as the result of advances in technic, amenable to exploration and occasionally to resection. Finally, I know that by a judicious extension of indications gastrectomy is a possibility even when the growth has extended to adjacent portions of the liver and pancreas or has

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metastasized to the regional lymph nodes, the omentum, and the colon.

In spite of these extremely encouraging considerations, however, I know that carcinoma of the stomach is not being cured, and that it is a fatal disease in the vast majority of all patients in whom it occurs. I think that we are deluding ourselves and stultifying ourselves if we cite as in any way typical of the general results those that are being achieved at the Lahey Clinic, let us say, or at the Mayo Clinic, or at the University Hospitals in Minneapolis. On the contrary, I am convinced that the unhappy results at such an institution as Charity Hospital of Louisiana at New Orleans are entirely typical of the true facts in this disease.

It is interesting to observe that surgeons from some of the institutions where results are unusually good are not as encouraged by what they are achieving as are others who quote them—and not always correctly at that. At the Mayo Clinic the percentage of operability approximates 60 per cent, the percentage of resectability is something over 25 per cent, and the mortality of resection is now well under 10 per cent.[1] These percentages have all shown some improvement in the last year or two. Yet Gray,[2] writing from the Mayo Clinic in 1942, called attention to two very depressing facts: (1). An analysis of all patients treated at that institution from 1907 through 1938 revealed very little difference between the ratio of operability for the whole period and for the last 15 years, and the improvement in the percentage of resectability was so slight as to be almost negligible. (2). With the possible exception of carcinoma of the lung, the five-year survival rates of patients with malignancy in the more common sites is appreciably lower in carcinoma of the stomach than in any other variety of cancer.

STATISTICS OF CHARITY HOSPITAL OF LOUISIANA AT NEW ORLEANS

On two previous occasions I have reported representative recent surgical cases of carcinoma of the stomach at Charity Hospital of Louisiana at New Orleans and have at the same time reported, without critical analyses, all the cases of that disease handled at the same institution during the preceding years.[3-4] I found no reason to be cheerful about gastric malignancy as the result of either study. I have recently studied 134 non-surgical deaths at the New Orleans Charity Hospital, 115 of which were verified by autopsy and 19 of which were diagnosed in the coroner's office. Though I have found no reason to be cheerful about this group of cases, either, I think I have found in them certain lessons which point the way to improvement.

In the 10 year period ending December 31, 1931, the hospital records showed that 758 patients with carcinoma of the stomach were admitted to the New Orleans Charity Hospital. Two hundred seventy-five of these, 36.2 per cent, were submitted to operation, with a mortality of 35.2 per cent (97 cases). The non-surgical hospital mortality during the same period was 30.6 per cent (148 of 483 cases). During the nine year period ending December 31, 1940, the records show that 1,209 patients with carcinoma of the stomach were admitted to the same institution. Three hundred forty-nine of these, 28.8 per cent, were submitted to operation, with a mortality of 41 per cent (143 cases). The non-surgical hospital mortality during the same period was 25.7 per cent (221 of 860 cases).

In the first series of 200 surgical cases which I analyzed from the New Orleans Charity Hospital in 1933, the percentage of resected cases was 17.5 and the mortality of resection was approximately 53 per cent. In the second similar series which I analyzed in 1941, the percentage of resected cases was 27.5 and the mortality of resection was 56 per cent. As the result of these studies, I concluded in 1941 that of every 30 patients with carcinoma of the stomach admitted to Charity Hospital, only 10 were submitted to operation, only two of the 10 were submitted to gastrectomy, and only one of the two left the hospital alive (fig. 1).

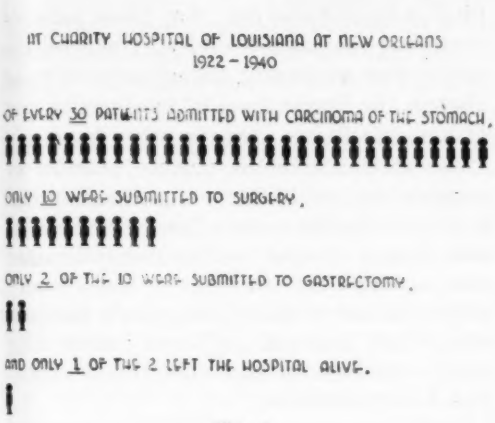
AT CHARITY HOSPITAL OF LOUISIANA AT NEW ORLEANS
1922 - 1940
OF EVERY 30 PATIENTS ADMITTED WITH CARCINOMA OF THE STOMACH,
ONLY 10 WERE SUBMITTED TO SURGERY.
ONLY 2 OF THE 10 WERE SUBMITTED TO GASTRECTOMY.
AND ONLY 1 OF THE 2 LEFT THE HOSPITAL ALIVE.

Fig. 1.

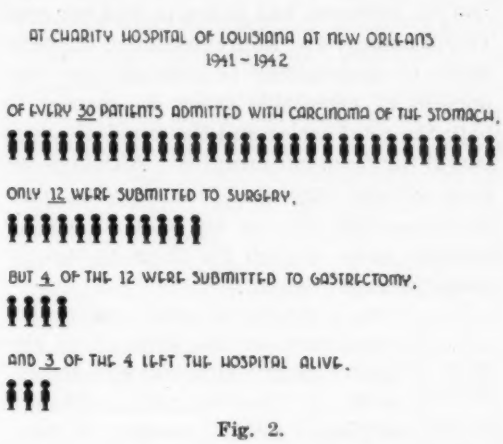
AT CHARITY HOSPITAL OF LOUISIANA AT NEW ORLEANS
1941 - 1942
OF EVERY 30 PATIENTS ADMITTED WITH CARCINOMA OF THE STOMACH,
ONLY 12 WERE SUBMITTED TO SURGERY.
BUT 4 OF THE 12 WERE SUBMITTED TO GASTRECTOMY.
AND 3 OF THE 4 LEFT THE HOSPITAL ALIVE.

Fig. 2.

COMPARATIVE PROPORTIONS OF RESECTABILITY AND MORTALITY IN THREE SERIES OF SURGICAL CASES OF CARCINOMA OF THE STOMACH FROM CHARITY HOSPITAL OF LOUISIANA AT NEW ORLEANS

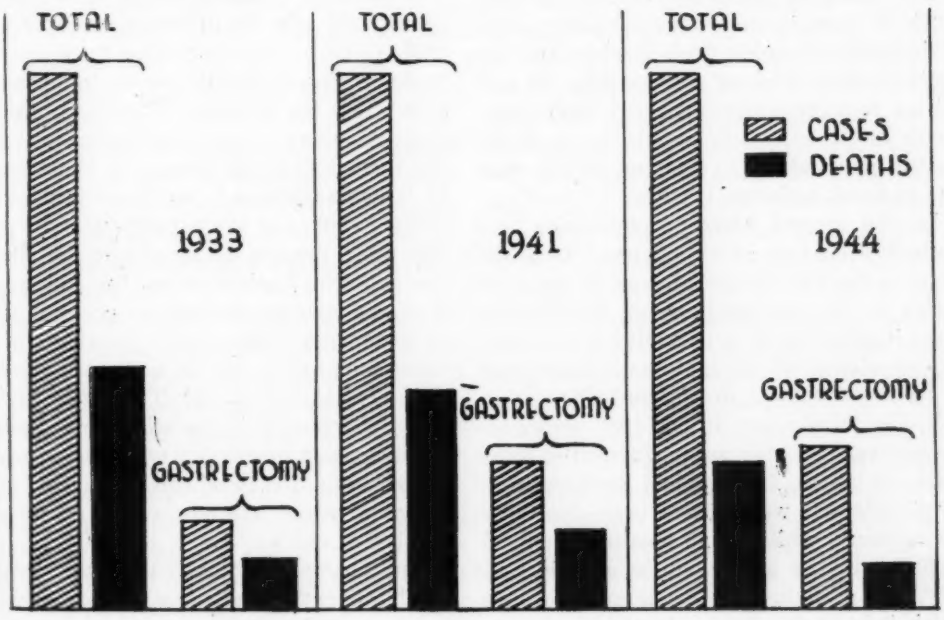

Fig. 3.

It must be granted that for the two year period ending December 31, 1942, the statistics are somewhat more encouraging (fig. 2). Of the 239 patients with carcinoma of the stomach admitted to the hospital, 95 (39.7 per cent) were operated upon, with a mortality of 27.3 per cent (26 cases), as compared with a non-surgical hospital mortality of 35.4 per cent (51 of 144 cases). The percentage of resectability for the whole series was 12.5 (30 cases) and 31.5 for the surgical cases. The mortality of re-

section, however, had fallen to 26.6 per cent (eight cases). The improvement in the mortality of gastrectomy is striking; the proportion of resectable cases, in respect to both the total series and the surgical cases, is still far from encouraging. Although we have greatly improved our surgical performance (fig. 3), we are still not seeing patients early enough for them to benefit from the improvement.

To a certain extent the discouraging aspects of carcinoma of the stomach at the New Orleans Charity Hospital can be explained away. In the first place, although gastric surgery is always surgery of magnitude, its performance there is not limited, as it is at private clinics and some general hospitals, to a small group of highly skilled and widely experienced surgeons. The combined 400 surgical cases which I have just mentioned were the responsibility of 62 surgeons, many of whom do not confine their work to surgery and some of whom were residents performing their first gastric operations (and who, of course, must be permitted to learn gastric surgery under adequate tutelage). As a result, some of the deaths, particularly in the first series, were due to frank technical errors.

In the second place, preoperative and postoperative care often left much to be desired in the 1933 series, though in the 1941 series it was generally good, and in the cases handled in 1941 and 1942 it was usually excellent, which explains a large part of the improvement in the mortality.

In the third place, in the 1933 series resection was probably not performed in some cases in which, if they had been encountered today, it would have been done, for gastrectomy, while by no means a surgical curiosity in the late twenties of this century, was still not the common procedure which it is at this time. In the second series, as well as in the cases handled in 1941 and 1942, the improvement in resectability was often achieved by a deliberate, and I think entirely justified, extension of the indications.

Finally, the explanation of the depressing results at the New Orleans Charity Hospital is the obvious one, that these patients represent the lowest level of financial capacity, and frequently, though naturally not always, the lowest level of intelligence and of hygienic living. On the other hand, my own experience in the private practice of surgery has convinced me that the financial ability to consult a physician without delay, and to pay for the best in hospitalization and nursing care, does not produce a very large number of resectable gastric cancers, even when financial ability is linked with native intelligence and exceptional educational opportunities.

I need not remind you, furthermore, that the whole picture of carcinoma of the stomach is actually much worse than the figures from Charity Hospital or from any other institution suggest. To the patients who die in hospital, with or without surgery, must be added certain other patients: (1) The patients whose growths have been resected, but who die in longer or shorter periods of time after their discharge; (2) the patients whose growths prove to be inoperable when the abdomen is opened, and the patients who are not explored at all, since the mortality in carcinoma of the stomach in which resection is not done is precisely 100 per cent; (3) the patients who die without their disease being diagnosed during life and who are not submitted to autopsy. Any one who has studied even small series of autopsied cases knows what surprises they can produce in the way of inaccurate clinical diagnosis. (4) The patients who die of carcinoma of the stomach outside of institutions, a proportion which is estimated in Saltzstein and Sandweiss'[5] study, for instance, at more than 40 per cent of the total number of deaths.

An analysis of the 134 non-surgical deaths recently studied, which occurred in the years 1930-1942, inclusive, proves certain of the points which I have just made. The diagnosis was not made in 11 of the 19 cases examined by the coroner, nor in 45 of the 115 cases examined by autopsy, that is, in 41.8 per cent of the 134 cases. In a number of the remaining cases it was merely set down as one of a number of possible

causes of death. In all fairness it must be said that these diagnostic failures were not always the fault of those who handled the cases. In the 19 coroner's cases the duration of observation was from two hours to two years, but 15 of the patients died within a week of coming under observation for the first time, and 13 of these died within 48 hours. In the 115 cases submitted to postmortem examination the duration of observation was from two hours to three years, but 30 of the patients died within a week of coming under observation for the first time, and 10 of these died within 48 hours. In the great majority of these fatal cases the patients had had no medical attention at all before they entered the hospital in what proved to be their last illness.

THE ROAD TO IMPROVEMENT IN CARCINOMA OF THE STOMACH

What lessons are to be learned from these tragic circumstances? Unless carcinoma of the stomach is diagnosed, it cannot be treated. How are diagnostic methods to be improved? Many of these cases, every one of which must be set down as a failure in both diagnosis and therapy, point the road to improvement.

There must be a much higher index of suspicion in regard to this disease. It must be kept in the back of the mind, so to speak, and brought forth as a possibility in the unlikely as well as in the likely cases. Let me illustrate:

Carcinoma of the stomach is most frequent in middle life and beyond, but it is not infrequent prior to that period, and it may occur in youth. In the surgical cases which I studied from the New Orleans Charity Hospital, one patient in every 10 was under the age at which cancer of any kind is ordinarily looked for, and negroes tended to develop the disease at an even earlier age than white subjects. In the 134 non-surgical deaths which I have just studied, the age range was from 26 to 83 years, and eight patients were under 40 years of age. Gastrointestinal malignancy was considered a possibility in two of these eight cases, but in two patients (35 and 37 years of age) no diagnosis was made, and the diagnoses in the remaining patients, who were respectively 26, 32, 33 and 35 years of age, were anemia, duodenal ulcer, tuberculous peritonitis, and syphilis of the stomach.

Carcinoma of the stomach must also be suspected in the presence of a wide variety of symptoms, many of which bear no apparent relation, direct or indirect, to the alimentary canal. So wide is the variety, as a matter of fact, that Moynihan[6] was fully justified when he said that as he read the histories of a series of patients with gastric malignancy, he was driven to wonder whether all of them could possibly have the same disease.

This series of non-surgical deaths, like the two surgical series of cases I have previously studied, perfectly illustrates that there is no classical picture of early, curable malignancy of the stomach. The classical picture is the terminal picture. The first symptoms in these cases took the form of dyspepsia, or various kinds of indigestion, or epigastric distress, or anorexia, or eructations, or heartburn, or dysphagia, or nausea and vomiting. Sometimes the first symptom was pain, which also took a wide variety of forms, and which was occasionally so severe and continuous as to suggest an acute abdominal condition. Sometimes the illness began insidiously and took the form of a "decline," manifested by loss of weight, which might be extreme, weakness, and lack of energy and enjoyment of life. Sometimes the onset was abrupt, with obstructive vomiting or hematemesis or both as the first manifestation. An occasional patient, as in the case reported by Gaines[7], complained chiefly of dyspnea. Hiccups were the first symptom in four cases, and, as I have pointed out previously, seem to deserve more attention than they receive. Sometimes the symptoms dated from a previous unrelated illness, from which there was never full recovery, or from a digestive disturbance which, instead of disappearing, became chronic. Two patients dated their illness from a blow and a fall, respectively, and another dated his illness from a kick by a mule. Seven patients had had digestive symptoms of long

duration which had recently changed in character, and 12 presented a distinct ulcer syndrome, concerning which I shall have more to say later.

In some of these cases—and this has been true in both of my other studies from the New Orleans Charity Hospital—carcinoma of the stomach developed in combination with other illnesses, such as cardiac disease, genitourinary disease, arthritis (which was regarded as the cause of death), a cerebral accident, and cataract, for which an operation had been performed three months before the patient entered the hospital to die of carcinoma of the stomach. A number of other patients had been treated in the wards and clinics for varying periods of time before their final admissions, either with undetermined diagnoses or on diagnoses of gastritis, appendicitis, indigestion, syphlis of the stomach (two cases) and anemia.

These cases carry their own lessons of missed opportunities. The first lesson is that patients in middle life and beyond should not be dismissed from observation until a definite diagnosis of their spmptoms, no matter how vague they may be, is arrived at. The second is that a patient with one disease is not immune to the development of another disease. Many cases of carcinoma of the stomach might be detected in their incipiency if the possibility were borne in mind for all patients in the so-called cancer years who come under observation for any cause whatsoever. In particular, patients in this age group with actual or supposed pernicious anemia should be examined at regular intervals by means of a barium meal, since carcinoma of the stomach and pernicious anemia are frequently associated, and since many instances of supposed pernicious anemia are actually secondary to malignancy of the stomach. Incidentally, four of these patients presented double malignancies, including, in addition to carcinoma of the stomach, carcinoma of the lung, of the kidney, and of the prostate gland (two cases).

While the error was not made in any case in this series, it might be well to emphasize that carcinoma of the stomach cannot be diagnosed on the basis of gastric analyses. Hypoacidity and anacidity are extremely suggestive, but the diagnosis is not excluded by their absence, and neither normal acidity nor hyperacidity is incompatible with a diagnosis of gastric malignancy.

Gastroscopy was not employed in a single case in this series. It was naturally not used in the earliest cases because it is a method of recent development. It was not used in some of the later cases because the patients died too promptly or were in too critical a condition to permit the use of a measure which, in spite of many improvements, is still something of an ordeal. In the remaining cases, however, it seems not to have been employed because carcinoma of the stomach was not suspected. Gastroscopy has marked a distinct advance in the diagnosis of carcinoma of the stomach and it should be employed in every suspected case. On the other hand, it should never be regarded as anything but an adjunct measure, and it should be disregarded if the negative findings are not in accord with the clinical picture.

Roentgenologic examination was carried out in 43 of the 134 cases, being omitted in the remainder for the same reasons that gastroscopy was not employed. In 25 cases the radiologist reported carcinoma of the stomach. But in two instances an extrinsic gastric mass was reported, in three instances the radiologic diagnosis was duodenal ulcer, and in 13 cases the findings were negative, and, unfortunately, were accepted as conclusive. To the last group must be added another case in which, two years before hospitalization at Charity Hospital, x-ray examination had been carried out at another clinic with negative findings; the patient was then lost from observation until the illness which ended her life.

Radiologic examination is the most important single measure in the diagnosis of carcinoma of the stomach, and Kirklin[8] states categorically that human negligence and not the method itself is at fault if it does not demonstrate a gastric cancer which gives rise to symptoms and which can be demonstrated macroscopically. Such perfec-

tion most radiologists do not achieve, and it is therefore a safe rule to disregard negative radiologic findings if they are not in accord with the clinical picture.

Useful as is the x-ray, it does not tell all, nor should it be expected to. In most cases it demonstrates the existence of a gastric lesion, it reveals with great accuracy where it is located, and it reveals with a high degree of accuracy how large it is. But in many cases it does not safely differentiate between benign and malignant lesions, and in no case should it be relied upon for a decision as to operability. If the radiologist were held responsible in these regards, says Kirklin, the outlook would be gloomy indeed, for he knows that most gastric lesions are malignant and that most malignant gastric lesions are inoperable. For my own part, as I have said before, I should like to see a return to the type of x-ray report of which Cole[9] spoke with such scorn, "This patient has a gastric lesion, the nature of which can be determined only by exploration."

GASTRIC ULCER VERSUS GASTRIC CANCER

I have long believed that the greatest field of improvement in gastric malignancy rests in the exploration, and that without undue delay, of every patient with supposed gastric ulcer who is over 45, or, better, who is over 40, years of age. That is not a radical point of view, though at first glimpse it may seem to be. On the diagnostic criteria of long-standing epigastric discomfort relieved by food, alkalis and a bland diet, and characterized by natural remissions, 25 per cent of the 400 surgical cases I have previously studied from Charity Hospital presented positive or possible ulcer syndromes. More than half of the patients had been treated by private physicians, or in the wards and clinics of the hospital, on this diagnosis, or had treated themselves on advice received over the radio or at the corner drug store. In the 134 non-surgical deaths, 12 patients presented an ulcer syndrome and six had been treated for peptic ulcer; the number, I believe, would have been larger had it been possible to secure adequate histories from all of these patients. The success of therapy in many of these cases is further proof of Moynihan's[10] observation that one of the causes of the high mortality of carcinoma of the stomach is the successful treatment of supposed gastric cancer which masquerades as ulcer.

These statistics are not unique. In other reported series the proportions are frequently higher. Thus Walters[11] states that at the Mayo Clinic "the most disastrous observation" in regard to the symptomatology of gastric malignancy was that 30 per cent of the patients gave a history of the ulcer type, in 10 per cent of the cases submitted to resection the radiologist had made the diagnosis of ulcer, and 80 per cent of the patients with carcinoma of the stomach who were treated for ulcer had responded favorably to medical therapy, and thus, it might be added, had lost much of their chance of salvation.

Allen and Welch[12] have recently published a particularly conclusive study of ulcer versus cancer at the Massachusetts General Hospital. Of 277 cases diagnosed as ulcer over a 10-year period, 14 per cent proved to be cancer. Of 175 cases in which medical treatment for ulcer was employed, 7.4 per cent proved to be cancer. Of 23 cases in which gastroenterostomy was performed for supposed ulcer, 17 per cent later proved to be cancer. Of 68 cases in which gastric resection was done for supposed ulcer, 43 per cent proved to be cancer. On the other side of the picture, of 344 cases in which resection or some palliative procedure was carried out for supposed carcinoma of the stomach, 5 per cent proved to be ulcer.

From these disturbing figures Allen and Welch draw certain conclusions to which I heartily subscribe: (1) When the differential diagnosis of ulcer and cancer arises, the question can be settled safely only by exploration and sometimes not then. (2). Patients beyond the fifth decade of life with recent digestive symptoms are five times more likely to have cancer than ulcer. (3). The risk of cancer in the prepyloric and fundal regions of the stomach far outweighs the risk of surgery for the lesion. (4). Although 50 per cent of all gastric ulcers

originate on the lesser curvature, that still leaves a 50 per cent chance that any supposed ulcer in this region is a cancer. (5). Although the incidence of cancer increases progressively with an increase in the diameter of the ulcer, and though a lesion of 2.5 cm. and over is likely to be malignant, there is no way of determining, in the absence of exploration, that lesions smaller than this are not malignant. One cancer in the series I have just studied from Charity Hospital was 0.5 cm. in diameter.

The whole acrimonious discussion which has arisen on the subject of gastric ulcer versus gastric cancer can be reduced to very simple terms: (1). Once the possibility of transition from ulcer to cancer is admitted, the proportion of cases in which the transition occurs is merely academic; the law of averages is of small assistance when one is dealing with a single individual. (2). There is often no possible way of determining, short of surgical exploration, what condition one is dealing with in any particular case. (3). The physician who accepts these facts will be very sure of his ground before he undertakes the medical treatment of supposed benign ulcer or supposed functional dyspepsia after young adult life, even though he means to employ the treatment only for differential diagnostic purposes.

THE RESECTABILITY OF GASTRIC MALIGNANCY

The most important and the most tragic lesson, yet in a sense the most encouraging phase, of this series of non-surgical cases is that, from the standpoint of their malignancy, not all of these patients ought to have died. In the 115 autopsied cases, eight of the 42 white patients and 20 of the 73 negro patients presented malignant lesions of the stomach which could readily have been resected. Twelve of the 28 died within two hours to seven days of their admission to the hospital, and only one patient in this group had had any previous medical treatment. No responsibility for their deaths can therefore be laid upon the hospital, or, except in the single case mentioned, upon the medical profession, except in so far as we have failed in our duty to educate lay persons as to the risks and potentialities of gastric cancer.

The remaining patients, however, are included in a group already mentioned, who had been previously treated in the hospital for unrelated diseases or for peptic ulcer and other disturbances of digestion, or for symptoms which, in the light of what later happened, must have been the first manifestations of malignant disease.

With only two exceptions these 28 patients had been admitted to the medical services of the hospital, a practice which W. J. Mayo[13] inveighed against in 1905 but which has not changed since his day. On the other hand, we as surgeons can feel no special pride in what happened in at least seven of these resectable cases, in all of which surgical consultation was requested. In one instance surgery was stated to be inadvisable because of the patient's age (71) and his cardiac state. In one instance the advice was to delay surgery until the effect of antisyphilitic therapy on the gastric lesion could be observed. In two instances only jejunostomy was stated to be possible, and this the patients, quite understandably, refused. In the remaining cases the malignancy was stated to be inoperable.

Yet from the standpoint of the disease itself, the lesion was resectable, not only in the seven cases for which surgical consultation was sought but in all of the other 21 cases in this special group, in six of which, incidentally, the diagnosis was not made. The location was prepyloric in 18 of the 28 cases, almost two-thirds, this being the most favorable of all locations for resection, and there was no instance in the group of carcinoma of the cardia, which is the most unfavorable of all locations.

It is true that in 12 cases the growth had metastasized to the regional lymph nodes, but such metastases, while they materially lessen the chances of long term survival, are no longer a contraindication to resection. It is true that in one case there was metastasis to the omentum and mesentery, and in another erosion into the transverse colon and metastasis to the cecum, but again, though

resection of the omentum adds somewhat, and resection of the colon considerably, to the surgical risk, these operations can be carried out together with resection of the stomach. It is true that in some cases the growth involved the major portion of the stomach, but total gastrectomy is a feasible procedure, even in aged subjects. It is true that the lesion was sometimes quite large, but mere bulk is not a contraindication to gastrectomy. It is true, finally, that some of the patients were in very poor condition, or had other diseases, but preparation for surgery is possible even in hopeless-seeming cases. Transfusions, infusions, vitamin therapy, and the use of some special diet, such as the Varco I and II diets[14], frequently achieve surprisingly good results even when all the odds seem against success.

The group of cases which I have classified as resectable does not include, it should be emphasized, any of the cases in which extension to the pancreas and metastasis to the liver were of moderate degree and so localized that resection might have been considered. It does include, however, one instance of perforation, of which, incidentally, there were 16 in the 115 autopsied cases, a very high proportion for an accident which is generally stated to be infrequent.

The patients in the seven cases in which surgical consultation was sought died within nine to 43 days of the consultation, and I am not sure, in view of their generally poor status, that surgery could have accomplished very much. I am concerned, however, with two facts: 1. That no effort was made to improve their condition, so that surgery might have been considered. 2. That in each of these instances the surgeon, given the chance for which he is constantly pleading, and for the lack of which he constantly blames the medical man, either misdiagnosed the case altogether or misdiagnosed the status of the growth.

In my 1941 report on carcinoma of the stomach at the Charity Hospital of Louisiana at New Orleans I found myself repeating a good deal which I had said in my 1933 report, and in this report I find myself repeating a good deal which I said in both papers. Certainly these 134 non-surgical cases prove the validity of my former conclusions: (1). Any improvement in the results of gastric cancer rests first with the patient. Until he presents himself to the physician no treatment is possible. (2). The basic problem, when once the patient presents himself to the physician, is how soon the physician turns him over to the surgeon, and how soon the surgeon operates, on suspicion if he cannot positively eliminate the possibility of gastric carcinoma. I do not in any way desire to detract from the heavy responsibilities which are carried by the surgeon who operates for gastric carcinoma when I point out that, as matters now stand, the lessening of those two intervals seems, at least in public hospitals, to offer the greatest hope of improving the present tragic results in this disease.

SUMMARY AND CONCLUSIONS

1. Brilliant results are being achieved in a small proportion of the cases of carcinoma of the stomach, chiefly at a small group of institutions, but the general picture of the disease is not bright elsewhere.

2. To two series of 200 surgical cases each studied from Charity Hospital of Louisiana at New Orleans in 1933 and 1941, respectively, is added the analysis of a group of 134 non-surgical fatalities, 115 of which were studied at autopsy and in 19 of which the diagnosis was confirmed by the coroner.

3. Early diagnosis, which is the key to improvement in this disease, will not be achieved until it is borne in mind that carcinoma of the stomach may occur in younger persons as well as in the so-called cancer years; is atypical in many cases and presents the so-called classical picture only in the terminal stages; and often occurs in combination with other diseases, the observation of which furnishes opportunities (usually overlooked) for detection of the malignancy in its incipiency.

4. Gastric analysis may be confirmatory but is never diagnostic. Gastroscopy is useful and roentgenologic examination is indispensable, but negative findings should

not be accepted if they are not in accord with the clinical picture.

5. The greatest field for improvement in carcinoma of the stomach lies in the surgical exploration, without undue delay, of all patients in middle life with supposed gastric ulcer. Gastric ulcer usually cannot safely be differentiated from malignancy of the stomach except by exploration at this period of life, and therefore cannot safely be treated by medical means.

6. In 28 of the 115 fatal non-surgical cases in which the diagnosis of carcinoma was confirmed by autopsy, the growths per se proved to be resectable. Surgical consultation had been invoked in seven of these cases, in six of which either radical surgery or all surgery had been stated to be impossible. It is suggested that surgeons need to develop more boldness in attacking this disease and should, after proper preparation, explore any patient in whom the mere opening of the abdomen would not prove fatal.

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DISCUSSION

Dr. Walter Moss (Lake Charles): I think Dr. Boyce is to be congratulated on the splendid review of an apparently hopeless subject at the present time. I do not look on it from the standpoint that it is as hopeless as the statistics point out, especially if Dr. Boyce continues to persevere and present these statistics.

There are a few points I want to bring out. One of these is that the puzzling cases go to the general practitioner and run the gamut of several doctors until the case is obvious and that has something to do with the bad results which Charity Hospital has, I am sure. We often see a patient in private practice with stomach ache or indigestion and he is given belladonna or what not and finally the case becomes obvious and the patient changes from one physician to another and the growth gets out of hand. At the present time the limit of time for the average physician to give to his patients, especially those with chronic ailments, will unfortunately add to disastrous results. I do not think any of us have the proper amount of time right now to give to these cases to make any great improvement in the statistics unless we give better attention to this type of case.

One helpful suggestion is the establishment of more adequate facilities at cancer clinics and extension of services to smaller communities. The economic problem of submitting the patients with preliminary symptoms of gastric carcinoma is at present a problem. The patient comes in with dyspepsia and at once you are limited by the fact that you can not submit him at that time to a complete physical survey. Whether that is the fault of the physician or the fault of our general economy, I am not going to attempt to answer. Some people think that they might have an answer to it in some various forms of state medicine but I still think the facilities would not be available because of the scarcity of specialists in some localities; roentgenologists, gastroenterologists as well as the surgeons.

The greatest work in cancer is now being done by the state cancer committee and the Woman's Field Army, parts of the American Society for the Control of Cancer. Education of the public is putting them in mind of noticing symptoms and insisting on the importance of having more adequate examinations. This is one of the things that will, I feel sure, decrease the mortality somewhat.

Dr. J. E. Heard (Shreveport): I am especially interested in this type of work and have very much enjoyed Dr. Boyce's splendid presentation of this most important subject.

Gastrectomy on the human being was first performed about 1881, Billroth performing the first

successful operation. Gastrectomy was attempted before this date, but the patients did not survive the operation. Following this, many men performed successful partial gastrectomies with the technic fast improving and a rapid reduction in mortality. At first, the mortality was around 88 per cent. Today the mortality in the hands of skillful man, has been reduced in some large series, as low as 5 per cent. In the hands of the casual operator, the mortality is still very high, from 30 per cent up.

About one-third of all malignant tumors are gastric cancers and surgery, we must remember, so far is the only means of effecting a cure. We know that these gastric cancer cases, if they get no relief, will only live three or four months after they enter the hospital, the average patients living about three months after hospitalization, provided no gastrectomy is done. The keynote to the success is team work, special training in this type of work, early operation and good postoperative and preoperative care, with early diagnosis. The resectability is about one case in three. Roughly, in gastrectomies in skillful hands, one case in every three survivés for three years, one in four for four years and one in five for ten years. When the cancer is confined to the stomach at the time of the operation, one in every two patients obtains a five year cure.

Pack and Livingston stress that no single method is suitable for every case of cancer, due to the situation of the lesions. The operator should be familiar with several types of gastrectomy. One of the secrets of success is the approximation of the soft parts without tension and the use of more absorbable interrupted sutures in the peritoneal layer.

As regards total gastrectomy, the mortality is still rather high and the long term cure at present is not there, but total gastrectomy is a feasible operation and the mortality is rapidly being lowered. Some people will live three to four years after operation. This operation is rather difficult technically, because the stomach, when a total gastrectomy is done, is more or less unapproachable, with a tendency of the contractible esophagus to pull away from the anastomosis. Some prefer to approach through the thorax; others through the abdomen. At times, it is almost mandatory that we go through the thorax. We are very much interested in this technic and at present are devoting a good deal of study to it. Possibly a gastrectomy through the thorax and abdomen combined may be best.

All in all, the technic of total gastrectomy must be very much improved yet to make it a practical operative procedure.

Dr. F. F. Boyce (in closing): The best figures on carcinoma of the stomach are from the Mayo Clinic, where the operability is now well over 60 per cent, the resectability over 30 per cent, and the mortality well under 10 per cent. The figures from Charity Hospital naturally do not approach any of these levels, and such improvement in resectability as we have achieved has been accomplished by a wide extension of indications, which I think is as it should be. These patients have no other chance of salvation.

The most encouraging thing about the situation at the New Orleans Charity Hospital is the decrease in the mortality of resection at the Hospital for the last two years. It has fallen from more than 50 per cent to about 27 per cent. In other words, while our percentage of resectability, when figured on the basis of all patients with carcinoma of the stomach who enter the hospital, is still depressingly small, we have halved the mortality of resection in the last two years, and there is every reason to hope that in the next two years it can be still further reduced.

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CLINICO - PATHOLOGICAL CONFERENCE

CHARITY HOSPITAL

NEW ORLEANS

CASE HISTORY

J. B., a colored female, aged three and a half months, was admitted August 16, 1943 and discharged December 22, 1943; readmitted January 1, 1944 and died February 29, 1944.

C. C.: Loss of appetite, vomiting, cough, and fever, for two weeks.

P. I.: The infant was born after a normal pregnancy and delivery, weighing six pounds, eight ounces. She was breast fed for three months and then placed on an evaporated milk formula. Cod liver oil was first offered at two months. At two weeks of age, intermittent attacks of diarrhea with "green shiny stools" appeared. Weight gain and appetite had been poor for at least two months.

P. E.: Temperature 104°, pulse 116, respiration 50, weight six pounds. The patient was a small, emaciated, irritable female; skin showed marked pallor and dilated superficial veins over the trunk. There was apparent neck rigidity. The anterior fontanelle was open, not bulging, and measured 3 cm. in diameter. She had an occasional cough and a few fine moist rales over both lung bases. There was a questionable enlargement of the heart to the left, a definite mid-precordial systolic thrill, and a definite, harsh systolic murmur over the base. Her liver was palpable 2 cm. below the costal margin.

Laboratory: Hemoglobin 8 gm. per cent, red blood cells 4 million, white blood cells 8,500 with 32 per cent neutrophils, 65 per cent lymphocytes, 3 per cent monocytes. Urinalysis, Mantoux (0.1 and 1.0 mg.), Kline and Kolmer were negative. Spinal fluid: clear and colorless, pressure of 250 mm., less than 10 cells, Pandy negative, chloride 752 mg. per cent. Blood and stool cultures were repeatedly negative.

EPA of chest on August 16, 1943, showed a normal heart but a feathery pulmonary infiltration and depressed diaphragms.

Electrocardiogram within normal limits for patient's age; QRS complexes diphasic in all leads. Rate 160, PR interval 0.10, QRS 0.05.

Gastrointestinal series and barium enema disclosed essentially normal bowel except for some "puddling" and adherences to the mucosal surfaces in the small bowel, some loss of haustral markings in the large bowel.

X-rays of long bones revealed osteoporosis and narrowed shafts.

Course: During the first ten days a course of sulfadiazine was given, which apparently returned her temperature to normal in three days. She now weighed five pounds. Thereafter during September, her temperature remained within normal limits. During October and November, however, there were occasional elevations with some wide swings from 97° to 103°. During febrile periods she became irritable, restless, lost weight, and on one occasion had a brief return of her cough, on another a mild conjunctivitis. On October 24, 1943, during a febrile period, a firm, tender swelling of the right parotid appeared. Another course of sulfadiazine was given without affecting the fever or parotid mass. The parotid swelling gradually became smaller and less tender but never disappeared. X-ray of this area showed a soft tissue swelling without invasion of the underlying bone. During December she remained essentially afebrile. Chest x-ray in December disclosed apparent enlargement of the heart to the left and extension of the feathery lung infiltration to the periphery.

During her entire period of hospitalization, the patient's voluntary intake of food was always inadequate. Vitamins were supplemented in nearly twice the usual requirements for her age. There were bouts of foul-smelling liquid stools and occasional periods of cough. She weighed eight pounds at discharge.

She was readmitted in January, 1944, with a history of draining ears of two weeks' duration. There was a purulent discharge from bilaterally ruptured tympanic membranes, no rales could be heard, the parotid mass measured 2 x 2 cm. and was not attached to underlying structures. Otherwise her physical condition was unchanged. Her hemoglobin was 8.5 gm. per cent, red blood cells 3.8 million. Her white count and differential were within normal limits. Urinalyses, Mantoux (0.1 mg.), Kline and Kolmer, spinal fluid, stool and blood cultures were all negative. CO_2 c. p. of blood was 40 vol. per cent, serum proteins 5.8 gm. per cent. Encephalogram showed a mild dilation of the third and lateral ventricles.

Sulfathiazole was given; sulfapyridine was substituted on February 4, 1944, and discontinued on February 23, 1944. After the first readmission day, she remained afebrile until February 1, 1944, when she again began an irregular fever ranging from 97° to 102.6°. Her ears continued to drain pus. There were no respiratory symptoms. In spite of high caloric, high vitamin, gavaged feedings, she lost weight steadily until at death she weighed six pounds, 10 ounces. During her last week of life, she became increasingly listless. On the day before death her eyes became glassy, she cried when touched, sucking reflex disappeared, marked diarrhea and vomiting reappeared.

Dr. Allan J. Hill: Diarrhea beginning at the age of two weeks with marked malnutrition and pulmonary lesions suggests immediately cystic fibrosis of the pancreas. The x-ray appearance of the lungs in this case conforms with that seen in this condition, but the stools were never typical. Qualitative studies of stool fat and starch content revealed no apparent abnormalities. Duodenal enzyme studies were not done.

In any malnourished child who has lung involvement associated with a history of difficult feeding, lipoid pneumonia should be considered. Oils, such as cod liver oil with a high fatty acid content, produce a more acute and severe reaction. Other less irritating lipids, such as milk butterfat, may produce a less intense but more prolonged process. The common denominator of all such cases is aspiration, which is relatively common in premature infants and in those who present feeding problems. These chest x-rays are not typical of lipoid pneumonia; one is more apt to see rounded areas of increased density or definite consolidation rather than the increased bronchial markings shown in this picture. Almost all children with lipoid pneumonia recover unless the disorder is complicated by pulmonary infection.

If this child's original infection at the first admission were interstitial pneumonia, the lingering wasting illness would be explained. The mortality of the initial acute infection is high; those recovering are apt to run a chronic course frequently terminating in bronchiectasis. A preceding contagious disease, such as measles or pertussis, is not necessarily present.

A fungus infection of the lungs, while possible in this case, would probably show the agent in the sputum and is somewhat more likely to produce nodular densities

on x-ray. The wasting and diarrhea could well fit into this picture if the fungus infection also involved the gastrointestinal tract.

Lymhadenopathy, parotid swelling, conjunctivitis, and lung changes suggest Boeck's sarcoid. This disease is rare in children; probably not more than 24 cases in children have been reported in the literature, the youngest of which was three months of age. Skin lesions usually are a part of this syndrome, but they are not necessarily present. Usually in Boeck's sarcoid there is much more enlargement of the hilar nodes than was present here.

Pulmonary tuberculosis is another possibility. The infant had at least four Mantoux tests during her long period of hospitilization. She had two three-day sputum concentrations, but these were examined only at the onset of her illness. All these investigations for tuberculosis were negative. The x-rays were not characteristic of tuberculosis, either of a primary infection or of a miliary spread. In addition, most cases of miliary tuberculosis survive less than six to eight weeks after the onset of the disease.

The parotitis could well be non-specific, as is often seen in cachectic states, rather than a part of a definite disease syndrome.

The presence of a harsh basal systolic murmur accompanied by a systolic thrill would suggest a congenital cardiac defect. In the absence of cyanosis, cardiac enlargement, and electrocardiographic changes, the most likely diagnosis is a defect in the interventricular septum. Anemia alone might explain such a murmur but not the thrill.

I believe the most probable diagnoses to be considered are cystic fibrosis of the pancreas, interstitial pneumonia with chronic pulmonary changes, and lipoid pneumonia. The heart lesion is most likely an interventricular septal defect.

Dr. Ralph V. Platou: I should like to mention several additional diagnostic possibilities. At first glance this case seems to justify the indefinite and hazardous term "constitutional inferiority," referring all difficulties to a basic germ plasm defect. The baby had, however, irrefutable symptoms and signs of congenital heart disease (probably ventricular septal defect) along with evidences of a number of other distinct organic distrubances. As a basis for the most prominent and obvious feature of marasmus (which this child exhibited to the nth degree) we know that a chronic systemic infection should be demonstrable as the most frequent cause; certainly unqualified marasmus, cachexia, or athrepsia alone is inadequate.

We expect the pathologists to demonstrate cystic fibrosis of the pancreas with secondary pulmonary changes. As you know, this condition can be differentiated from the general celiac syndrome during life by demonstrating a deficiency of trypsin in the duodenal contents; we tried to secure duodenal drainage but were unsuccessful. Hypoproteinemia was demonstrated, and at various times we were impressed by equivocal manifestations of multiple avitaminoses, in spite of the fact that the infant had been given a high caloric-high vitamin diet. This leads us to believe that there must have been specific or general defects in absorption or utilization of the various dietary essentials, most likely on the basis of pancreatic insufficiency.

Malignancy was of course strongly suggested by the cachectic appearance of this baby throughout our period of observation. We had felt quite confident that the parotid tumor represented either a primary endothelioma, hemangio-endothelioma or possibly an unusual metastatic lesion from an undetermined primary lesion elsewhere. The surgical consultants justifiably refused either to remove or biopsy this parotid tumor because of the extremely poor condition of the patient; we agreed with them that it would be wiser to learn the nature of this lesion from post mortem study, inasmuch as it appeared all too obvious that no constructive operative work would be possible during life.

It is certainly true that all the clinical features we have observed in this case could be explained by a diagnosis of Boeck's sarcoid. The fact, however, that this lesion has

not been described in any patient so young makes it seem very unlikely, and the only reason we considered this possibility was the fact that we could not prove our first suspicion of tuberculosis by means of the usual diagnostic criteria, namely, intracutaneous testing, roentgen-ray examination, or repeated examination of sputum secured by gastric lavage.

Dr. Roscoe Pullen: What about Hand-Schüller-Christian's disease?

Dr. Platou: The child never had any demonstrable xanthomata and did not exhibit diabetes insipidus.

Student: What about subacute bacterial endocarditis?

Dr. Platou: It seems that there are enough possibilities to consider already. Subacute bacterial endocarditis is extremely unusual in infants. This child never demonstrated the typical "spiking" fever, had no embolic phenomena, and blood cultures were repeatedly negative.

Dr. J. D. Russ: I did not see this patient so what I say is based on what I have read in the abstract. One diagnosis Dr. Hill mentioned as a possibility was lipoid pneumonia. The diagnosis of lipoid pneumonia is based on two bits of evidence—the history and x-ray findings. The history is not compatible and there is some doubt about the x-ray findings. The x-ray findings in lipoid pneumonia should show more extensive involvement of the right lung. I would like to bring up two other diagnostic possibilities, one, congenital heart disease, and two, syphilis.

Dr. Ernest Stark: Anatomic Findings. This child weighed only 8 pounds. It was extremely undernourished. There was no swelling of the parotid although this was looked for with care.

Dr. Hill and Dr. Platou have both made the correct anatomic diagnosis of the cardiac lesion. There was a small interventricular septal defect. The right ventricle was large and dilated. The foramen ovale was patent, but the opening was covered by a flap of endocardium. The pulmonary valves showed a further congenital deformity. There were only two leaflets. These were somewhere thickened along their free margins. Microscopically, these valves showed edema but there were no inflammatory changes. The bifurcation of the pulmonary artery occurred just above the level of the pulmonary valves.

An incidental finding was a small tumor of the left adrenal medulla. On microscopic examination this proved to be a neuroblastoma which has as yet not spread beyond the confines of the gland. It is safe to say that this tumor had nothing to do with the child's illness or death.

The cause of death in this case was tuberculosis. This child had miliary tuberculosis. We have been unable to determine when the first infection took place, but there was evidence that the initial infection involved the lung. The evidence for this was an enlarged tracheobronchial lymph-node showing extensive caseation and fibrosis. I am unable to demonstrate the primary focus in the lung itself because the lungs showed numerous disseminated tuberculous nodules of varying size.

The liver showed many minute tubercles. The spleen was likewise involved but here the tuberculous lesions were of larger size and many showed gross caseation.

There were no ulcerations in the intestinal tract and the mesenteric lymph-nodes were not remarkable. The pancreas showed no abnormalities on either gross or microscopic examination.

Another finding of interest was a tuberculous salpingitis on the right side. The entire tube was swollen to about twice the normal diameter and the entire wall showed caseation and necrosis. The left Fallopian tube was normal on gross examination but microscopically, there were a few early tubercules like the one reproduced in this lantern slide.

Dr. Hill: I am embarrassed that I missed the diagnosis in this case. However, on the basis of the findings I believe I would make the same mistake again. Repeatedly negative Mantoux tests over this long a period of time and two negative gastric washings discouraged a serious consideration of tuberculosis. However, a persis-

tently negative Mantoux could consistently occur in the presence of marked emaciation. Could there be caseation of the degree demonstrated in this case in the lesions of Boeck's sarcoid?

Dr. Stark: The clinical findings could be explained by Boeck's sarcoid but the pathological findings could not be so explained. Caseation and necrosis never assume such marked proportions in sarcoid lesions. We have looked for acid-fast bacilli and have found a few organisms in some of the lesions.

Dr. Julius Lane Wilson: I would like to ask something about this case. What is the incidence of primary focus six months before death? What happened? Did this child live for six months with generalized tuberculosis, or did this appear recently? I can not answer these questions, and I think they are important.

Dr. Stark: I can say this—all these lesions showed either marked caseation or else simply small tubercules composed entirely of epitheloid cells and lymphocytes without much caseation. None showed fibrosis to the extent where it could be said that the lesion was healed, or healing. No calcification was present. This means that these were fairly recent lesions, but exactly how old I could not estimate. They could certainly have occurred in a few weeks.

Dr. Wilson: It seems incredible to me that the x-ray did not show miliary tuberculosis. It is most probable that the patient was infected before she came into the hospital; she had a primary lesion, then salpingitis, and from this, hematogenous dissemination leading to the final stages of miliary tuberculosis. It is incredible that she had nine months of miliary tuberculosis.

Dr. Stark: I agree with you that it seems a long time to live with miliary tuberculosis.

Dr. Wilson: I think we have this point to consider. You cannot exclude a diagnosis of tuberculosis because of negative tests.

Dr. Stark: Of course we are not surprised because an infection of this type often gives negative tests.

Dr. Platou: We are certainly willing to accept the lesson this case teaches—that there is no test for the presence of tuberculosis which is absolutely infallible, accurate as these are in the great majority of cases. I feel quite confident that given this same situation, we would again consider a diagnosis of tuberculosis to be quite adequately excluded by the procedures previously mentioned. I should like to ask Dr. Wilson his opinion concerning the danger and infectious nature of such an unrecognized case of miliary tuberculosis in the hospital.

Dr. Wilson: A student is less apt to contract tuberculosis working in a tuberculosis sanatorium than he is on the medical and surgical wards where unrecognized tuberculosis is apt to be present. The students should be allowed training with infectious diseases, but he should protect himself to the greatest possible extent. I would regard the parents, friends, and family contacts of such a patient a great danger to the other children on the wards. The child with miliary tuberculosis alone could constitute no possible danger to the personnel or other patients. In these cases, the lesions are confined to the perivascular tissues and do not communicate with the air passages.

Clinician's Diagnoses:

1. Cystic fibrosis of pancreas.
   Chronic pulmonary fibrosis and bronchitis.
2. Congenital heart disease.
   Cyanose tardive group.
   Interventricular septal defect.

Pathologist's Diagnóses:

1. Miliary tuberculosis.
2. Congenital heart disease.
   Interventricular septal defect.
   Low bifurcation of pulmonary artery.
   Bicuspid pulmonary valve.
3. Neuroblastoma of adrenal.

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DEMEROL

The new synthetic analgesic, demerol, was synthesized in 1939 by Eisleb and Schaumann. Recently reports on its pharmacology and clinical use have appeared in this country, and its application has increased. In two articles by Yonkman, Noth and Hecht* the results of pharmacologic studies and clinical observations are reported.

The pharmocologic studies in animals and man cause the authors to conclude that demerol is a safe drug readily absorbed after oral, subcutaneous or intramuscular use, with a weak atropine-like action and a moderately strong papaverine-like effect. It produces an analgesic, spasmolytic and sedative effect. In humans it does not produce an intestinal stimulating action. Its atropine-like effect produces mydriasis, suppression of saliva, and insulation of the heart, bronchi and intestine against vagal stimulation. Its papaverine-like spasmolytic action directly relaxes the bronchi, intestine, uterus and blood vessels. Like morphine it produces analgesia, sedation, euphoria and sometimes morphine-like side-effects.

Since 1939, many clinical reports on the use of the drug have been published in South America and European literature, covering observations on several thousand cases. Since 1943, a few reports have appeared in this country. These authors compare their clinical results in 146 patients, and compare them with those previously reported. The usual dose for adults was 100 milligrams; the dose ranged from 50 to 200 milligrams. The dosage for children is stated to range from 10 to 75 milligrams. It has been administered orally, intramuscularly, subcutaneously or by rectal suppositories occasionally. When used intravenously it should be diluted and given slowly. In their cases the drug was given usually in 100 milligram doses, orally or intramuscularly, from one to eight times daily. The intramuscular route is more prompt than the oral route, and is preferred over the subcutaneous administration because of irritation.

In 64.2 per cent of the cases with severe pain, complete relief occurred in from five to 20 minutes when given by needle, and from 20 to 30 minutes when given by mouth. Its duration varied from one to six hours, the average being three or four hours. Partial relief occurred in 23.6 per cent, and no relief in 12.2 per cent.

The analgesic potency in 100 milligram dose was greater than one grain of codein and less than one-quarter to one-sixth of morphine. Three out of four patients with status asthmaticus were benefited by the drug. Side effect occurred in 27.4 per cent. The drug may have properties causing ad-

diction, but these are said to be less marked than some of the opiates, morphine and its derivatives. It was used in a variety of conditions and the authors feel that demerol may replace these drugs in many conditions.

A further report is presented by Batterman† who analyzes the results in over 4,000 patients treated at Bellevue Hospital since 1941. Be believes its greatest usefulness is in the postoperative relief of pain because its failure to produce deep narcosis, respiratory depression, urinary retention, or alter the cough reflex makes it more desirable than morphine. It is equally effective as morphine in controlling pain due to smooth muscle spasm. It was used in pleuritic and arthritic pain, in chronic chest conditions, as an analgesic in obstetrics, in pruritus, acute or chronic asthma, myocardial infarction and as a pre-anesthetic sedative. It is regarded as a relatively safe drug with less liability to habit formation than morphine.

*Yonkman, Frederick F., Noth, Paul H., and Hecht, Hans H.: Demerol, a new synthetic analgetic, spasmolytic and sedative agent. I Pharmacological observations, II Clinical observations, Am. Int. Med., 21:7, 1944.

†Batterman, Robert C.: Demerol: A new synthetic analgesic: Its indications as a substitute for morphine, Conn. State M. J., 8:13, 1944.

KIDNEY CALCULI

This important urological problem is discussed with relation to the formation, recognition and treatment of kidney calculi by Randall.* He discusses the five general theories of stone formation, avitaminosis A, hyperparathyroidism, infection, colloidal imbalance and stasis. None of these solve the problem of etiology completely but must be considered along with contributing factors, and that stone is only a symptom of a pre-existent pathologic lesion. The author states that in his opinion only two essential conditions are necessary for the formation of stone; "first, a primary tissue damage, and second, a permanent or transient and oft repeated, hyperexecretory state."

As to treatment, pyelolithotomy is briefly discussed and then ureterolithotomy and instrumental manipulations for ureteral calculi. The author feels that the use of spinal anesthesia in these last two procedures is most important because of the perfect relaxation produced.

The prevention of kidney calculi will be greatly aided by a knowledge of the chemical character of the stone. The uric acid stones demand a careful metabolic study and an alkalinizing drug to keep the p H of the urine at about 6.0. The oxalate stone suggests dietary management and moderate alkalinization. In both cases all focal infections should be removed and at least 2,000 cc. water taken daily. The calcium phosphate stone should be assured a well-balanced diet and tested for hyperparathyroidism. He states that after all the "taking of larger quantities of water daily is perhaps the surest answer to our question of prevention."

*Randall, Alexander: Recent advance in knowledge relating to the formation, recognition and treatment of kidney calculi, Bull. N. Y. Acad. Med., 20:433, 1944.

ARTERIOSCLEROSIS

The etiology of this very important pathological process has been under constant investigation. Nothing need be said to emphasize our lack of definite information that would assist in the prevention of a condition which has so much to do with the problems of advancing age. Many factors have been enumerated and one phase of the subject which has attracted considerable attention is the relationship between hypercholesterolemia and atherosclerosis. Some investigators have shown experimentally a suggested relationship.

Studying this problem clinically Shaffer* concluded that an increased cholesterol intake did not in his observations increase the incidence of atherosclerosis, at least as far as the coronaries were concerned. One hundred patients on a high cholesterol diet were compared with 500 patients eating normally and there was little or no difference in the two groups.

The patients were old duodenal ulcer

cases on a milk and cream diet. Coronary arteriosclerosis was considered present when there was coronary occlusion with myocardial infarction, angina pectoris and certain conduction disturbances. In the group three per cent had myocardial infarction, three per cent had angina pectoris and three had evidence of arteriosclerotic heart disease. In the control group in the same age bracket, 45-65 years, same sex ratio, 19:1 males to females, there was an identical three per cent with coronary occlusion with myocardial infarction, 2.5 per cent with angina pectoris and 5 per cent with arteriosclerotic heart disease.

The author felt that these observations justify the conclusion that unless there is an associated endocrine imbalance, there is no clinical evidence of causative relationship between hypercholesterolemia and atherosclerosis.

*Shaffer, Carl F.: The nutritional role of cholesterol in human coronary arteriosclerosis, Ann. Int. Med., 20:948, 1943.

ORGANIZATION SECTION

The Executive Committee dedicates this page to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

INITIATION OF A PHYSICAL FITNESS PROGRAM

In July, 1944, at a hearing of the Subcommittee of the Senate on Health and Wartime Education, Major General Lewis B. Hershey, Director of the Selective Service System, is quoted to have said:

"If the citizenry of the future is to be prepared to insure peace by being able to make war, and if the citizens of the State are to be physically able to carry out their other duties efficiently and effectively, then there must be definite and positive measures taken to insure the development, the training and the conditioning of our youth to the end that they will be physically strong and emotionally stable. If they are not physically strong and emotionally stable, they will not be able to use the knowledge which has been imparted to them in our schools. It is idle to talk of a democracy, in which each citizen has equal opportunities with every other citizen and equal responsibilities with every other citizen, unless these citizens each and every one are able when the responsibility comes to carry their part. There is no justice, there is no fairness, there is no democracy when 16,000,000 of our citizens must carry the load of 22,000,000 of our citizenry; and unless and until we are able to take such measures which will insure that the maximum of our citizens are able to bear arms, and able to accept all of the responsibilities of citizens, we can have democracy only in name."

Colonel Leonard G. Rowntree, Chief of the Medical Division, National Headquarters, Selective Service System, after presenting detailed analysis of the causes for rejections, advocated a program for making the nation biologically fit for whatever is its mission in the postwar world. Quotations from this presentation are as follows:

"The Government of the United States—Federal, state, or local—has a rightful concern in the poor state of health evidenced in Selective Service findings. The rejectee in many instances is the victim of our modern civilization. The failure has been that of Federal, state, and community authorities of the parents, of education, the church, and of medicine, dentistry and public health, and to some extent of the individual concerned. The remedy calls for concerted action on the part of all these groups responsible for the situation which was found to exist.

"The Sociological and economic factors are indissolubly bound up with the availability and utilization of good medical care. We are not the vigorous people that we thought we were. The people must be educated to accept the fact that we have a high

percentage of defects, deficiencies, disabilities, disorders, and diseases. We must be educated to demand medical care in proportion to the demonstrated need of that care."

On September 18, 19, and 20 another series of hearings were conducted in which the President-elect of the American Medical Association, Dr. Roger I. Lee, appeared. He offered some constructive suggestions and defended the medical profession in their handling of selectees and also the wonderful record made by the profession in maintaining this country on such a low mortality and morbidity rate. This has been accomplished while some 55,000 of our doctors have been removed from civilian service in the Armed Forces. He specifically urged that owing to the great number of rejectees 4,000,000 of the total number examined or 35 per cent, one-sixth of whom were remedial, that the medical profession had a grave and serious problem to consider. That the medical profession was conscious of its responsibilities and that ordinary medical care of the people of the United States is not enough. It must be good medical care. Various other distinguished members of the profession appeared before the committee to give their impressions and constructive thoughts on this vital problem. These hearings were conducted under the authority of Senate Resolution number 74 which authorizes the subcommittee to make a full and complete study and investigation regarding the distribution and utilization of medical personnel, facilities, and related health service. It was brought out by the testimony of Dr. Thomas Parran, Surgeon General of the United States Public Health Service, that the Social Security Agency and the United States Public Health Service had some very definite plans for the support and relief of this lack of physical fitness as evidenced in the above rejectees. As a result of all these hearings, a committee of one hundred was appointed by the President of the United States comprising some of the most capable physicians to draw up some definite plans for action by the various states. The United States Public Health Service, in cooperation with the American Medical Association, appointed a National Committee for this purpose. Colonel Leonard G. Rowntree, Chief of the Medical Division, National Headquarters, Selective Service System, is Chairman of this Committee. Some appeal has been made evidently to the Governors of various states for the purpose of calling a conference to consider remedial methods to improve the physical fitness of the youth of this country. Accordingly, on October 19 there was held a conference in Baton Rouge of all the leading organizations who would obviously be concerned in any definite physical fitness program. This conference was arranged by Jess W. Hair, Chairman, Committee on Recreation and Physical Fitness, Louisiana Civilian Defense Council, under auspices of the Department of Health of Louisiana, at the request of Governor James Davis. The Louisiana State Medical Society was represented at this conference. They also have a representative on the Executive Committee. It was agreed at the Executive Committee meeting that before any definite plans for physical fitness were developed and approved that the following principles be adopted: First, a comprehensive physical program plan from the cradle to the grave; second, a survey to be made of the state in regard to facilities as presently available and the future need in any plan developed for physical fitness in the state; third, each member of the Executive Committee was to write to the chairman his ideas for a definite physical fitness plan.

The above facts are presented for the purpose of *informing our profession* of the thoughts and attitudes of some of our national leaders in the medical profession, and it is well to visualize just what we are faced with in our respective state. Unquestionably, the medical profession is most desirous of taking its place in some constructive plan to obviate the high rate of rejectees and evidence of lack of physical fitness. Furthermore, it is very plain to all thinkers that a Utopia in this regard is not

possible, but by properly coordinating and correlating the various forces needed and maintained on a state level we might endeavor to develop a suitable program to take care of this serious situation. The seriousness of this is very evident, and unless we organize and accomplish the proper spirit and cooperation on a state level the Federal Government is prepared to come in and supervise or take over such action as may be deemed advisable. The medical profession of this state should therefore give its earnest thought and consideration and instruct its representatives in the medical profession the course and manner to be pursued.

It must be very astounding to all those who had the occasion to know that on October 4 the American Public Health Association adopted a report favoring in effect a Federal plan of compulsory health insurance. This was done without due consultation with medical and dental leaders of the nation. These organizations had previously made such a proposal to the American Public Health Association. All those interested in this report will find a copy of same in the October 14 issue of the American Medical Association Journal on page 441. From the above it would not seem that we have yet removed the dangers of the Wagner-Murray-Dingell Bill or its implications as contained in the amendment to the Social Security Act, Senate Bill 1161. It is very distressing to know that we have such dissention in our midst. The personnel of the American Public Health Association is about ninety-five per cent physicians. However, the majority of these are primarily interested in preventive and public health work, and do not see eye to eye with the regular practitioners of medicine in civilian life.

There will be a meeting of our Executive Committee on November 11 in New Orleans. At this time due consideration will be given to the selection of dates, location, and character of meeting to be held for the 1945 session of the Louisiana State Medical Society. You are urgently requested to make your desire and wishes known to your officers and councilors in your respective districts in order that they may bring to this meeting the attitude of the profession in this regard, or on any other problem.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

CALENDAR OF MEETINGS

Nov. 1 Mercy Hospital Staff, 8 p. m.
Nov. 2 Clinico-pathologic Conference, Touro Infirmary, 11:15 a. m.
Nov. 6 Chaillé Memorial Oration, Hutchinson Memorial Auditorium, 8 p. m.
Nov. 7 Eye, Ear, Nose and Throat Hospital Staff, 8 p. m.
Nov. 8 Women's Auxiliary, Orleans Parish Medical Society, Orleans Club, 3 p. m.
Clinico-pathologic Conference, Marine Hospital, 7:30 p. m.
Touro Infirmary Staff, 8 p. m.
Nov. 13 Scientific Meeting, Orleans Parish Medical Society, 8 p. m.
Nov. 15 Charity Hospital Surgical Staff, 8 p. m.
Nov. 16 Clinico-pathologic Conference, Touro Infirmary, 11:15 a. m.
Nov. 17 I. C. R. R. Hospital, 12:30 p. m.
Nov. 20 Hotel Dieu Staff, 8 p. m.
Nov. 21 Charity Hospital Medical Staff, 8 p. m.
Nov. 22 French Hospital Staff, 8 p. m.
Nov. 23 Clinico-pathologic Conference, Touro Infirmary, 11:15 a. m.
DePaul Sanitarium Staff, 8 p. m.
Nov. 24 New Orleans Hospital Dispensary for Women and Children Staff, 8 p. m.
Nov. 28 Baptist Hospital Staff, 8 p. m.

HOSPITAL NEWS

At the first fall meeting of the Staff of Mercy Hospital held October 4, Dr. Edgar Hull spoke on carcinoma of the lung and Dr. F. F. Boyce discussed the surgical aspects of this condition. A motion picture on modern nutrition was shown. The X-ray Department of the hospital has announced that the present equipment will soon be replaced by a new and far superior radiographic unit. A new Young urologic X-ray table has been secured for the cystoscopic room, and a new inductotherm has been ordered to replace the present diathermy machine. Dr. Louis A. Monte has

been elected Chairman of the Mercy Hospital Nursing School Faculty; Dr. Charles Midlo, Vice-Chairman; and Drs. E. L. Zander, and Geo. Hauser members of the Board. Fourteen nurses received diplomas at commencement exercises held, September 1.

NEWS ITEMS

At the Seventh District Medical Society meeting at Jennings September 28 Dr. Donovan C. Browne spoke on the differential diagnosis of diarrhea and Dr. J. D. Rives on carcinoma of the rectum.

Dr. Alton Ochsner recently addressed the Fulton County Medical Society in Atlanta, the Lawson General Hospital, and the Sheffield Cancer Clinic.

Dr. Emil E. Palik served as one of the quiz-masters for the examination in pathology which was part of the examination conducted by the American Board of Orthopedics at Tulane University School of Medicine, September 29-30.

Dr. Bernard B. Weinstein has been appointed to the Research Co-ordinating Committee of the American Society for the Study of Sterility.

Dr. Guy Caldwell has been elected Vice-President of the Orleans Parish Chapter of the National Foundation for Infantile Paralysis.

At the ninth annual assembly and convocation of the United States Chapter of the International College of Surgeons held in Philadelphia October 5, Drs. J. C. Menendez, M. Lyon Stadiem and C. Walter Mattingly were admitted to fellowship and Dr. Eugene H. Claverie was admitted to membership.

Dr. Dean H. Echols attended the meeting of the American Academy of Neurosurgery at White Sulphur Springs, September 14-16.

Dr. T. J. Dimitry has been informed of his election to active membership in the Association for Research in Ophthalmology. The objects of the Association are "to encourage, promote, foster and assist investigations and research in ophthalmology."

Dr. Daniel J. Murphy, Secretary.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

TULANE GRADUATION

The second class of students to graduate from Tulane Medical School in 1944 were given their diplomas Saturday, October 14. Dr. Jacob C. Geiger delivered the Graduation Address and was given an honorary degree by the University.

On Friday, October 13, the Ivy Day Program was held, at which time Dr. E. C. Faust gave the Ivy Day Address. Charles D. Knight presented the class gift to Dr. H. W. Kostmayer. The following prizes were awarded: Isadore Dyer Medal to John W. Deming; Querens-Rives-Shore Award to Ross F. Bass; Walter Reed Memorial Medal to Emile A. Bertucci, Jr.; Jacob C. Geiger Medal to Arnold H. Baum; Sidney K. Simon Prize to Charles D. Knight; award by the Professor of Medicine to James C. Prose and John W. Bassett, with honorable mention to Juan Arosemena and Pascal G. Batson, Jr. Announcement was made of Alpha Omega Alpha membership from the Junior class to Thomas G. Baffes.

SYMPOSIUM ON THE HEART AND CIRCULATION

A most successful three-day course on the cardiovascular system was held at Louisiana State University Medical School on October 25-27. Participating in the program were various members of the Department of Medicine of Louisiana State University as well as other local men. Visiting lecturers included Dr. Maurice Visscher of the University of Minnesota School of Medicine; Dr. Isaac Starr of the University of Pennsylvania School of Medicine and Dr. Frank N. Wilson of the University of Michigan School of Medicine.

SOUTHERN MEDICAL ASSOCIATION

The 1944 meeting of the Southern Medical Association will be held in St. Louis beginning the week of November 13. The program for the first day and a half will consist of clinical sessions. Beginning Tuesday afternoon, November 14, and continuing through Thursday, programs of twenty sections of the Association will be presented.

There will be conjoint meetings with the Southern Branch of the American College of Chest Physicians, of the American Public Health Association, and the American Society of Tropical Medicine.

At the general public session Dr. Herman L. Kretschmer, President of the American Medical Association, will give the annual address. There will also be an address by Major Albert J. Stowe, who will speak as a personal representative of Major General Clayton Bissell, Assistant Chief of Staff, G-2 (Military Intelligence). On Wednesday evening there will be another general public session devoted to "Medicine in the War" at which occasion there will be motion pictures and speakers from top ranking officers of the Army and Navy.

There will be no official social activities at any time.

ALPHA OMEGA ALPHA

The Stars and Bars chapter of Alpha Omega Alpha honorary medical fraternity initiated, on the evening of Wednesday, October 4, 1944, the following undergraduate Senior students of Tulane: John W. Deming, William J. Langlois, Jr., Charles Knight, Emile Bertucci, Jr., Philip Bergman, John W. Bassett, Herbert M. Perr, Henry R. Hyslop, Fernand Dastugue, Jr., Alan Leonard, Nadene Denison, and John P. Fischer.

Dr. H. W. Kostmayer, Dean of the Tulane Medical School, was made an honorary member.

The newly created Alpha Omega Alpha Lectureship was delivered by Dr. Anton J. Carlson, Professor Emeritus of Physiology at the University of Chicago School of Medicine. The title of Dr. Carlson's address was "Some Unknowns in the Physiology of Aging."

DR. ROY CARL YOUNG HONORED

At the meeting of the National Association of Private Psychiatric Hospitals held at the Bellevue-Stratford Hotel, Philadelphia, Pennsylvania, on May 14, 1944, Doctor Roy Carl Young of Covington, Louisiana, of the Fenwick Sanitarium, was elected to the Board of Trustees of this organization for a three-year period.

Doctor Young was also honored on being appointed on the membership committee and Chairman for the Local Division South.

NEWS ITEMS

Dr. John R. Schenken, professor and Director of the Department of Pathology and Bacteriology, Louisiana State University School of Medicine, addressed the Second District Medical Society of Florida at Quincy, Florida, on October 19. He spoke on the relationship of hormones to cancer and on the pathology of amebiasis.

The following communication has been received dated Quebec, August 25, 1944:

"We regret very much to inform you that for reasons beyond our control, the Congress of the Association of French Speaking Physicians of North America which was to have taken place on September 5-7 has been postponed to a later date. We hope to reorganize later and count on your presence at that time. If you have already paid your dues, it will serve for the next Congress. The membership card is the official receipt."

The Annual Conference of State Secretaries and Editors will be held at the office of the American Medical Association in Chicago, November 17-18.

It is with regret that we learn of the departure from the city of Mr. Donald H. Higgins, managing editor of The New Orleans Item. Mr. Higgins has been much interested in civic affairs in the city and particularly with medico-social activities. He has been one of the active members of the Board of the Tuberculosis Association of New Orleans and has been a vigorous and active worker in the Social Hygiene Association of the city.

Notice has been received of the opening of the following district office of the Division of Nurse Education, U. S. Public Health Service:

District 4, 1307 Pere Marquette Building, 150 Baronne Street, New Orleans 13, Louisiana: Miss Elsie T. Berdan, Nurse Education Consultant in charge. Territory includes: Alabama, Florida, Georgia, Louisiana, Mississippi, New Mexico, South Carolina, Texas and Tennessee.

The next written examination and review of case histories (Part I) of the American Board of Obstetrics and Gynecology for all candidates will be held in various cities of the United States and Canada on Saturday, February 3, 1945, at 2:00 p. m. Candidates who successfully complete the Part I examination proceed automatically to the Part II examination held later in the year. All applications must be in the office of the Secretary by November 15, 1944.

SOUTHERN BAPTIST HOSPITAL

The regular clinical staff meeting was held on the evening of September 26 at 8:00 p. m. in the auditorium of the hospital. The program consisted of a presentation by Dr. Julius W. Davenport, Jr., entitled "The Rh Factors." Dr. Joe Wells then presented the death report of the previous month.

MEDICAL OFFICERS NEEDED

The Civil Service Commission has announced a new examination for Rotating Interneship and Psychiatric Resident positions at St. Elizabeth's Hospital, the Federal institution for the treatment of mental disorders, in Washington, D. C. The positions pay $2,433 a year, including overtime pay. Further details may be obtained in Journal office.

AMERICAN HOSPITAL ASSOCIATION

Dr. A. C. Bachmeyer, director of the University of Chicago Clinics, was appointed to conduct a two-year survey of America's hospital system at the initial meeting of the Commission on Hospital Care in Philadelphia August 1. The Commission was organized on the request of members of the American Hospital Association for an independent, unbiased study to serve as a basis for plans for future hospital facilities and the extension of those already in service.

In his capacity as permanent director of study, Dr. Bachmeyer will make a survey of hospital facilities in three states—California, Michigan, and one in the South—to determine the health needs of every segment of the population, and to investigate the potentialities for an even wider distribution of hospital service.

On the basis of these studies, a nation-wide plan looking toward greater co-ordination among hospitals will be developed, aimed at extending hospital care of the sick and injured equally to all—the farmer, the laborer, the urban dweller, and those groups requiring specialized attention for mental and incurable diseases.

Dr. Thomas S. Gates, president of the University of Pennsylvania, is chairman of the Commission, which has been financed by a fund of $105,000 contributed by the Kellogg Foundation, the Commmonwealth Fund of New York, and the National Foundation for Infantile Paralysis.

INFECTIOUS DISEASES IN LOUISIANA

The Louisiana State Board of Health reported that for the week ending September 16 there were reported 39 cases of pulmonary tuberculosis, 29 of measles, and 18 of endemic typhus fever. There were no other diseases reported in numbers greater than 10. Of the unusual diseases there were listed two cases of poliomyelitis, one from Bossier and one from Grant Parish, and five cases of typhoid fever scattered over the state, no one parish having more than one case. For the week ending September 23 the following cases were reported: 29 of pulmonary tuberculosis, 16 of unclassified pneumonia, 15 of malaria, 14 of endemic typhus fever, 13 of bacillary dysentery, and 10 each of mumps and typhoid fever. There were two cases of meningococcus meningitis reported, one each from Rapides and West Carroll Parishes. Five cases of poliomyelitis were also listed this week, no one parish having more than one case. The week ending September 30 contained the venereal disease statistics for the previous four weeks. During this time there were reported 1,340 cases of syphilis, 1,319 of gonorrhea, 40 of chancroid, 19 of lymphopathia venereum, and 12 of granuloma inguinale. In addition to these diseases that are reported each month, the following diseases that are reported weekly occurred in double figures, 36 of pulmonary tuberculosis, and 17 each of measles and unclassified pneumonia. There were three cases of meningococcus meningitis reported, one from Jefferson and two from Orleans Parish. Four more cases of poliomyelitis were also reported, scattered over the state. The week of October 7 still found pulmonary tuberculosis leading with 44 cases, followed by 16 each of endemic typhus fever and unclassified pneumonia, 14 of measles and 11 of bacillary dysentery. Ten of the malaria cases were reported from military sources. Of the unusual diseases there was listed one case of meningococcus meningitis from Orleans Parish, and one case of poliomyelitis from Caddo Parish.

HEALTH OF NEW ORLEANS

The Bureau of the Census, Department of Commerce, reported for the week ending September 16 there were 115 deaths in the City of New Orleans. Of these deaths there were 73 in the white population and 42 in the colored. The total number of deaths also comprised 11 deaths in children under one year of age, six white and five colored. For the week of September 23 there were 122 deaths, divided 74 white, 48 nonwhite, with 13 deaths in children under one year of age, four white and nine negro. There was an increase in the total number of deaths during the week of September 30, 136 people dying this week, of whom 82 were white and 54 colored. The deaths among children under one year of age was practically the same as the previous week, being a total of 14, divided nine white and four colored. The following week, October 7, there was a sharp decline in the total number of deaths. 104 people dying this week, divided 58 white and 46 nonwhite. Of these 11 deaths were among infants under one year of age, seven white and four colored.

DR. WILLIAM A, LURIE

(1881-1944)

Dr. Lurie died after a brief illness on Sunday, September 25. He was born in Chicago in 1881, and was a graduate of Rush Medical College of that city. He came to New Orleans about 30 years ago, and in latter years specialized in physiotherapy and x-ray work.

BOOK REVIEWS

Infections of the Peritoneum: By Bernhard Steinberg, M. D., New York, Paul B. Hoeber, Inc., 1944. Pp. 455. Price, $8.00.

Peritoneal infections are a not infrequent source of serious trouble to surgeons as well as to their patients. Largely because the mechanisms of the various developmental stages of the disease may be misunderstood, the factors which might otherwise be capable of successfully controlling the outcome of these infections sometimes get beyond the possibility of medical manipulation. In the present book Dr. Steinberg offers a comprehensive survey and analysis of what is known in regard to the pathogenesis of peritoneal infection and its treatment.

The contents include a review of the changes in physiology and pathology associated with the progressive stages in the infection; the chemical and hematological changes which are noted in the disease; special features of peritonitis in children and penetrating injuries of the abdomen; diagnosis by various means including x-rays; also various methods for the prevention and therapy of peritoneal infections. The approach is commendable, as the author tries to present impartially the evidence leading to the present-day point of view regarding the various aspects of the problem. The figures and tables are instructive, while there is a monographic list of reference at the end of each chapter. A feature which may be of particular value to clinicians is the series of well-presented case reports, illustrating various factors in the development of the different types of infection and their outcome. The book should be read by surgeons, clinicians and bacteriologists interested in the understanding of bacterial infections as they develop in the individual patient.

MORRIS F. SHAFFER, D. Phil.

Civilization and Disease: By Henry E. Sigerist, M. D., D. Litt., LL.D. New York, Cornell University Press, 1943. Pp. 255. Price, $3.75.

The William H. Welch Professor of the History of Medicine in the Johns Hopkins University, Dr. Henry E. Sigerist, delivered the six Messenger lectures under the auspices of Cornell University. He has elaborated these lectures, which deal with the evolution of civilization, into a book of twelve chapters. In the first chapter Sigerist deals with civilization as a factor in the genesis of disease. In this he notes that a large part of the evolution of disease from the time of the neolithic man to the present date has been profoundly affected by such factors as cleanliness, malnutrition, poverty, housing, clothing and even gluttony. In chapter two the relation of disease to economics is elaborated upon in some detail. Here he points out that the poor man is the man who is most likely to suffer from illness. People in the lower economic scale are more susceptible to disease. Taking the economic problem from the other point of view, he presents evidence to show that disease itself produces a tremendous economic loss in the civilized population of the country. In chapter three the lecture has to do with disease and social life. In this section he discusses such important diseases as syphilis, tuberculosis, as well as mental disease and brings forth the concept that the modern treatment of these disorders, which were at one time looked upon as almost sufficient to ostracize the individual sufferer, has now swerved towards gentleness and kindness in the treatment of these people who are sick, irrespective of the type of illness. In the subsequent chapters he discusses the relationships that exist between disease and religion, disease and science, disease and literature, music and art, all of which chapters are thought provocative and presented in a style which makes for easy and agreeable reading. The last chapter on civilization against disease, the socialistic point of view for which Dr. Sigerist has antagonized many physicians, is accentuated. As a proponent of governmental and subsidized medicine, however, Sigerist has not presented this particular contention in a way that would irritate the average physician, as he is moderate in his expressions but does give one distinctly the impression that he thinks socialized medicine should exist wherever civilization exists and that the maintenance of the health of the people is one of the primary functions of the state. He has not ridden this hobby hard in the book but does stress what so many doctors believe, if there is inadequacy in medical care for those of the lower income group it is more dependent upon economic conditions and ignorance, than it is upon lack of available and skilled physicians, and their faulty distribution.

J. H. MUSSER, M. D.

Physical Medicine in General Practice: By William Bierman, M. D., New York, Paul B. Hoeber, Inc., 1944. Pp. 654. Price, $7.50.

This book is essentially a therapeutic text of physiotherapy designed to acquaint "the practitioner in general medicine and special fields of medicine with how he might us physical measures with the others he employs in his effort to be of greatest service to his patient". The author does this efficiently and without cluttering his material with unessential historical data, lengthy discussions on the physics of electricity, etc. He does include physiological changes which result from the application of physical agents. The author points out that the absence of such physiological observations in the past has led to an empirical application of physical medicine with the "resultant

rejection of large sections of this phase of therapy by the medical profession". The sections on application of physical medicine to the various specialties are concise and contain much specific information of therapeutic value.

The chapter on "The Conduct of Treatments" is outstanding in its warnings and instructions as to the avoidance of the various pitfalls of physiotherapy.

The appendix which contains specifications for physical therapy equipment as issued by the Department of Hospitals of the city of New York will be of value to anyone considering the purchase of any apparatus. As a whole the book is well worth reading and should enlighten many members of the profession who are wont to condemn physical medicine as a tool of the charlatans.

JACK WICKSTROM, M. D.

A Manual of Physical Therapy: By Richard Kovács, M. D., 3rd Edition thoroughly revised, Philadelphia, Lea & Febiger, 1944. Pp. 309. Price, $3.25.

This interesting manual is published in its 3rd edition as a response to the increased interest in physiotherapy which the rehabilitation of casualties of the present war has stimulated. The previous editions were published under the title "Physical Therapy for Nurses" and, although completely revised, this present edition has many of the "earmarks" of a teaching text (i.e.) questions at the close of various sections useful in quizzing, etc. The ilustrations are satisfactory and adequate, but are not of equal caliber with the text. The chapters on electrotherapy and light therapy are very comprehensive and are well written. The chapters on exercise, rest, relaxation and occupational therapy are extremely important, and although well planned and well written, have not been stressed sufficiently.

As a whole the book is a valuable contribution to the literature on physiotherapy. It would serve very admirably as a text for a much needed course in physical medicine which is so conspicuously absent from the curricula of present medical education. It is not as complete or comprehensive in this field but serves adequately as a small manual.

JACK WICKSTROM, M. D.

Tuberculosis of the Ear, Nose and Throat, including the Larynx, the Trachea and the Bronchi: By Mervin C. Myrson, M. D., Springfield, Ill., Charles C. Thomas Co., 1944. Pp. 291. Price $5.50.

This book covers tuberculosis of the ear, nose, and throat completely, and otolaryngologists, internists, and practitioners will find it a valuable guide. The exposition of the diagnosis, prognosis, and treatment are well-written, and the therapeutic measures are based on sound reasoning. The bronchoscopist will find the chapter on tuberculosis of the trachea and bronchus very interesting and helpful.

JOSEPH LAU, M. D.

Hydronephrosis and Pyelitis of Pregnancy, An Historical Review: By H. E. Robertson, M. D., Philadelphia, W. B. Saunders Co., 1944. Pp. 332. Price, $4.50.

One has to read this book to appreciate its value and the enormous amount of labor and time entailed in the compilation of the data presented.

The information dates from earliest times to the present day recorded opinions relating to dilation of the upper urinary tract and its associated infection when present.

The material is presented in a most concise manner with a complete bibliography appended.

This text has a place in the library of every obstetrician and urologist.

MONROE WOLF, M. D.

Plaster of Paris Technic: By Edwin O. Geckeler, M. D., Baltimore, The Williams and Wilkins Company, 1944. Pp. 220. Price, $3.00.

This is an interesting handbook on plaster of paris technic adequately described by a well coordinated text and illustrations; the materials used, methods of manufacture and the various technics employed in the application of casts and splints necessary for the protection of fractures, sprains, and other soft tissue injuries and infections. The technic of using plaster bandages as well as the technic of the less familiar pattern plaster are completely described.

The chapter devoted to errors and difficulties is exceptionally valuable and points out the various pitfalls associated with the use of plaster of paris; the result of such errors and methods by which they may be avoided.

It is interesting to note that although plaster is used almost universally and has been used since the earliest time for immobilization of fractures and joint injuries, very little has been written on the use of plaster and the technic of application.

The urgent need for a book written on the use of plaster of paris in surgery and the technic is filled by this interesting and well illustrated handbook. It is both suitable for instruction of graduate and under-graduate medical students; and will prove of interest to every surgeon who has the occasion to use plaster of paris.

JACK WICKSTROM, M. D.

Bacterial Infection, with Special Reference to Dental Practise: By J. L. T. Appleton, B. S., D. D. S., Sc. D., Philadelphia, Lea & Febiger, 1944. Pp. 498. Price, $7.00.

This is a book which merits well the success implicit in the appearance of a third edition. The purpose expressed in the title is achieved in marked

degree in the text and in a manner to hold the reader's interest as well as to inform him of the facts. The volume is divided into three parts. In the first part there is an adequate but not excessive survey of the principles of bacteriology, the chapters on antibacterial action of chemicals, surgical antisepsis and asepsis being particularly good. Part II treats the subject of infection as an entity; that is to say, it discusses the various modes of infection and the manifold defense mechanisms of the body. The fundamentals of immunology are in general summarized competently although there are a few places where the presentation may leave a reader new to the subject with a perhaps erroneous impression. Part III covers the present state of knowledge concerning the common infections associated with the oral cavity. This section is of exceptional interest and excellence; the problems of oral disease and oral hygiene are treated here in a fashion at once authoritative yet objective. The physician interested in problems of oral infection, the dentist who is anxious to obtain modern knowledge of oral hygiene and to see it more widely disseminated, the bacteriologist who wishes to have at hand in compact form data on oral bacteriology derived often from original sources which are not readily available to him—all will find themselves reading this section with pleasure as well as profit. There are many references to recent publications of original research, which add greatly to the value of the book. We agree with the sensible member of the dental profession to whom we showed the volume and who said, after a thorough inspection, "I must buy this book at once for my reference library."

MORRIS F. SHAFFER, D. Phil.

PUBLICATIONS RECEIVED

W. B. Saunders Company, Philadelphia and London: A Textbook of Pathology, by Robert Allan Moore, M. D.

Grune & Stratton, Inc., New York: Neurology of the Eye, Ear, Nose, and Throat, by E. A. Spiegel, M. D. and I. Sommer, M. D.

Lea & Febiger, Philadelphia: Principles and Practice of Surgery, by W. Wayne Babcock, M. D.

J. B. Lippincott Company, Philadelphia, London and Montreal: Surgery of the Hand, by Sterling Bunnell, M. D.

Froben Press, New York: History of Gynecology, by Richard A. Leonardo, M. D., Ch. M., F. I. C. S. Chronology of the Evolution of Plastic Surgery, by Maxwell Maltz, B. S., M. D., Sc. D., F. I. C. S.

Halstead, Kansas: Ventures in science of a Country Surgeon, by Arthur E. Hertzler, M. D.